THE

# AMERICAN JOURNAL OF PHARMACY.

MARCH, 1865.

## ON A NEW PROCESS FOR MAKING CONCENTRATED FLUID EXTRACTS.

By N. Spencer Thomas.

*Mr. Editor*,—Having been several years engaged in making fluid extracts of that class representing pound by pound* the crude drug, on a large scale for the trade, and always on the alert for the best process, and finding extracts prepared in "vacuo" much approved—and justly so, too, as compared with any other process then known—I adopted that plan as the best for evaporating, and found, after close observation of its working for a long time, that it was perfection for making solid extracts; but even with it, there was an imperfection in the preparation of fluid extracts. This imperfection or defect seemed at first to be insurmountable, as the difficulty was not in the mode of evaporation, but in the operation itself. Where there is any mixture of menstrua of different volatility, as alcohol and water, the difficulty that presents itself is simply this: the first part of the process for making a fluid extract is making an alcoholic tincture with alcohol more or less strong, according to the nature of the drug. The next step is to evaporate or distil, and as we can thus avoid over a hundred degrees of heat, we introduce the tincture into the vacuum-pan and proceed; the alcohol being most volatile, evaporates or distils off first, leaving the desired measure of fluid extract without alcohol, or very little, if any—it being in fact an aqueous solution, or mixture of an aqueous solution with various precipitates which would require alcohol to be held in solution, varying according to

[* The author probably intends "pound to pint," or ounce to fluidounce. Grain to minim is the correct expression.—Ed. A. J. Ph.]

the nature of the drug started with in the process. The next step is to filter out all or a great part that is valuable, and sell or dispense the aqueous solution under the impression that it is a good preparation.* This mode of proceeding has been somewhat improved on by retaining the first running of tincture, to mix with an aqueous solution obtained by continuing the displacing and distilling all the alcohol off. The result of this mixture, in most cases, is a double precipitation, sometimes followed by a *partial* re-solution, leaving the operator in a quandary whether to filter and have a preparation presenting a handsome appearance, or not filter, and have a less handsome but really better one.

In casting about for a perfect process for making these most desirable preparations, a plan was adopted and pursued for a time, of making all extracts into the pilular consistence, keeping memoranda of yield in percentage, and using these solid extracts for making the fluid extracts by solution in menstrua of the proper strength for holding all the medical virtues in solution, using whatever amount of extract obtained from a pound of crude drug to make a pound of fluid extract. This plan was found to make a good fluid extract, and to have some advantages. Using my own vacuum extracts, and always knowing the exact strength of the same, I had full faith that I had as good fluid extracts as could be made by any other known process, and fully reliable as regards amount of drug represented by each pound. But it involved two processes for one preparation, and the plan was abandoned in favor of the process for which I have obtained a patent. This process I believe to be perfection in every respect; and as it covers pretty broad ground, I doubt its ever being equalled by any other plan. It has none of the faults that had always to be contended with; and which I considered insurmountable until this discovery was made, which was somewhat in the following manner. It suggested itself in thinking of the manufacture of linseed oil, in which violent pressure is used.

* This statement, in reference to the value of the precipitated matter, conveys a false impression, as it could be true of only a limited number of substances. If it was the author's practice in all cases not to add the necessary proportion of alcohol, his preparations must have suffered. It certainly was not the usual practice.—Ed. Am. Jour. Pharm.

The fluid in that case existing naturally in the substance; in this case it has to be added in the shape of the proper solvent. This solvent is added part at a time, and it is necessary that it should be so regulated in strength, alcoholically, as to be capable of dissolving out, as well as holding in solution, all the medicinal substances existing in the crude drug; it is believed the same strength of solvent is required to accomplish both objects. The operation is a simple one, but requires an expensive press and considerable skill to carry it out properly. The drug is ground to proper fineness in such a manner as to avoid fine dust or the necessity of sifting out fine dust, as it is apt to contain the most valuable parts of the drug. This can be done best in a mill of the description for several years sold by me to the trade, and now sold by Mr. Charles T. Iredell, of Bristol, Pa. The fineness must necessarily be regulated by the nature of the substance—harsh substances can be ground finer than those of a soft nature. After being ground, the drug is moistened or dampened with part of the solvent, which for any particular lot in progress, must always be of same strength. After being allowed to stand in a closed vessel for a short time, it is submitted to a powerful pressure. This operation of moistening and pressing is repeated several times, with liquid or solvent always of same strength, until the same amount of liquid is obtained that there was of the drug after being ground. When sufficient liquid is obtained, nothing further is necessary but to mix and filter. As heat and evaporation and long exposure to atmospheric air are all avoided, and if the moistening and pressing are properly done the drug is entirely exhausted, it must be apparent that we have a preparation by this process that is perfection itself. Its superiority over any process hitherto known must be apparent; as in avoiding heat, we avoid the changes that all substances are subject to by cooking; in avoiding evaporation, we avoid the changes in strength of solvent, and consequent precipitation of substances more or less valuable; and in avoiding exposure to atmospheric air, we avoid all chance of oxidation and evaporation and their consequences.

On examination of preparations of substances of a fragrant nature made by this process—for instance, fluid extracts of

Buchu and of Sassafras Bark,—they will be found to be very much superior to those made by any other process; having all their aroma and fragrancy, and in fact having a freshness that cannot possibly be obtained in any other way. The almost entire tastelessness of the refuse of powerful substances, such as Jamaica Ginger, after being submitted to this process, is considered satisfactory proof of the capabilities of the process. The novelty and consequent patentability of this process was shown by the prompt allowing of the Patent, as soon as it was presented to the Patent Office. Annexed is a copy of the Patent. From close observation of the workings of this process, it is believed that the great pressure used has effects that would not at first be supposed. The small amount of liquid is, of course, at first application, perfectly saturated with soluble substance, if there be enough to saturate it; then the pressure has the effect of pushing the liquid from the centre of the mass past the other particles, or through them giving greater chance for solution. The liquid obtained by first pressing is very strong, becoming weaker at each succeeding pressing, until exhaustion is complete or nearly perfect. By noting the amount of liquid put on and taken off at each pressing, if the solvent is the proper one, the amount of valuable substance remaining, though very small, can be ascertained with mathematical certainty. For instance, if a lot has six pressings, taking out two-thirds of the strength in it at commencement of each pressing, the sixth pressing will leave in fourteen one-hundredths of one per cent. of substance in it at the commencement of the operation, soluble in the liquid used. If same number of pressings are given, each taking out one-half, the last pressing will leave in one and nine-sixteenths of one per cent. of original amount of substance soluble in the liquid used. Persons wishing to avail themselves of the use of this Patent, on liberal terms, will please address the Patentee.

N. SPENCER THOMAS,
*Painted-Post, Steuben County, N. Y.*

These Extracts (as well as the Mills) are now made and sold by Mr. Charles T. Iredell, Bristol, Bucks County, Pa., twenty miles from Philadelphia.

*The United States of America, to all whom these Letters Patent shall come.*

Whereas, N. Spencer Thomas, of Painted-Post, New York, has alleged that he has invented a new and useful improved process for making Concentrated Fluid Extracts, which he states has not been known or used before his application—has made affirmation that he is a citizen of the United States; that he does verily believe that he is the original and first inventor or discoverer of the said Invention, and that the same hath not, to the best of his knowledge and belief, been previously known or used. Has paid into the Treasury of the United States the sum of Thirty-five dollars; and presented a petition to the Commissioner of Patents, signifying a desire of obtaining an exclusive property in the said Invention, and praying that a Patent may be granted for that purpose. These are, therefore, to grant according to law to the said N. Spencer Thomas, his heirs, administrators, or assigns, for the term of Seventeen Years from the Thirty-first Day of January, One Thousand Eight Hundred and Sixty-five, the full and exclusive right and liberty of making, constructing, using, and vending to others to be used, the said Invention—a description whereof is given in the words of the said N. Spencer Thomas, in the Schedule hereunto annexed, and is made a part of these presents.

In testimony whereof, I have caused these Letters to be made Patent, and the Seal of the Patent Office has been hereunto affixed. Given under my hand, at the City of Washington, this thirty-first day of January, in the year of our Lord one thousand eight hundred and sixty-five, and of the Independence of the United States of America the eighty-ninth

(Copy.)

{Seal of the Patent Office.}

J. P. USHER,
*Secretary of the Interior.*

Countersigned and sealed with the Seal of the Patent Office.

D. P. HOLLOWAY, *Commissioner of Patents.*

*The Schedule referred to in these Letters Patent, and making part of the same.*

To all to whom it may concern:—Be it known, that I, N. Spencer Thomas, of Painted Post, in the County of Steuben, and State of New York, have invented a new and improved Process for making Concentrated Fluid Extracts, and I do hereby declare that the following is a full, clear, and exact description of the same. This invention relates to an improved Process for producing that class of Extracts which are

made so that a certain amount of Liquid shall represent, pound by pound, medically the same quantity of crude Drug, and which are generally obtained by extracting with a large excess of liquid and evaporating down to the desired strength. The disadvantages of the old process are well known to every chemist. The menstrua used for making extracts are usually of an etherial or volatile nature—such as alcohol of various strength—and their strength changes by evaporation as they are exposed for a longer or shorter period to the open atmosphere. If such menstruum is poured over a certain drug, it dissolves and extracts more or less of the soluble parts of the same according to its strength; but if the same liquid has to be poured repeatedly over the same drug, it loses its strength alcoholically, and some of those portions first dissolved are precipitated, and an imperfect extract is the result. The value of the extract being determined by its alcoholic strength when finished, the same or similar reasons render it objectionable, to subject the extract, when first obtained, to the evaporating process; for by this process, the volatile or spirituous parts of the menstruum are first evaporated, and the weaker liquid is not capable to keep in solution many of those parts of the drug which originally had been dissolved in the extract.

These objections are obviated by my process, which is carried out in the following manner: I first weigh off a quantity of drug, and the same quantity, or more by weight, of the menstruum or liquid by means of which the extract is to be made. A little more of the menstruum being required, as a little moisture is left in at last pressing. The drug being ground to proper fineness, is then dampened with a small portion of the liquid and subjected to heavy pressure (say from 800 to 1000 tons), whereby all the liquid, or nearly so, together with such parts of the drug which have dissolved in the same, is expressed. A fresh portion of the liquid is then sprinkled over the drug; a little time being allowed for the liquid to dissolve the soluble parts of the drug, and the same process of pressing repeated until the whole quantity of liquid is used up and the drug is completely exhausted, and the required measure obtained. By this process, an extract is obtained which represents, pound by pound, the crude drug. The drug is perfectly extracted, and the menstruum preserves its original strength throughout, so that the same is capable to retain in solution all those parts which are dissolved during the various stages of the process. Furthermore, by my process, the tedious and expensive process of evaporation is dispensed with, and concentrated fluid extracts of any description can be produced cheaper and better than by any process heretofore applied; and as the application of heat is entirely avoided, the preparation does not receive the injury by heat that all such preparations are liable to, if heat is applied to them, no matter how carefully applied or moderate the degree of temperature; and furthermore, the change thereby of strength of solvent is avoided.

What I claim as new and desire to secure by Letters Patent, is the

within described Process of producing Concentrated Fluid Extracts, by bringing the crude drug gradually in contact with the desired measure of Liquid to be represented by the extract, and exposing it after each application of liquid, to a heavy pressure—substantially as set forth; whereby extracts of uniform strength can be made, and both heat and evaporation avoided.

N. SPENCER THOMAS.

*Witnesses.*
C. F. Platt, A. J. Banter.

[NOTE.—The process of Mr. Thomas noticed above, merits the careful attention of our Colleges of Pharmacy, as guardians of the interests of medicine and pharmacy. If the claims made for the process are *true, within practicable limits*, we esteem it of great value, for the reasons given in the paper by the author; but if it be *not true*,—or at least *not true in practice*—that a drug may be thus exhausted of its valuable medicinal constituents, measures should be taken by our Colleges to prevent the innovation from being recognized as a proper and efficient method; at least so far as relates to the officinal fluid extracts. It is the interest of the inventor, therefore, to submit his process as early as practicable to a committee of pharmaceutists, that its claims may be tested. Mr. Thomas is a graduate in Pharmacy, and has had considerable practical experience in making pharmaceutical preparations.—ED. AM. JOUR. PHARM.]

---

## U. S. ARMY MEDICAL STOREKEEPERS.

BY HENRY N. RITTENHOUSE, U. S. A. M. S., AT CINCINNATI, O.

The law creating the above officers was approved May 20th, 1862; its provisions are:—

"That the Secretary of War be authorized to add to the Medical Department of the Army, Medical Storekeepers, not exceeding six in number, who shall have the pay and emoluments of Military Storekeepers of the Quartermaster's Department, who shall be skilled Apothecaries or Druggists; who shall give the bond and security required by existing laws for military storekeepers in the Quartermaster's Department, and who shall be stationed at such points as the necessities of the army may require.

*Provided*—That the provisions of this Act shall remain in force only during the continuance of the present rebellion."

And chapter No. 201, Military Laws U. S., Section 16th, approved July 17, 1862, provides—

"That Medical Purveyors and Storekeepers shall give bonds in such

sums as the Secretary of War may require, with security to be approved by him."

General Order No. 55, War Department, Adjutant General's Office, Washington, May 24th, 1862, announced the following regulations, which governed the appointment of Medical Storekeepers:

1st. A board of not less than three Medical Officers will be assembled by the Secretary of War to examine such applicants as may, by him, be authorized to appear before it.

2d. Candidates, to be eligible to examination, shall not be less than 25 years or more than 40 years of age; shall possess sufficient physical ability to perform their duties satisfactorily; and shall present with their applications satisfactory evidence of good moral character.

3d. Candidates will be required to pass a satisfactory examination in the ordinary branches of a good English education, in Pharmacy and Materia Medica; and to give proof that they possess the requisite business qualifications for the position.

4th. The board will report to the Secretary of War the relative merit of the candidates examined, and they will receive appointments accordingly.

5th. When appointed, each medical storekeeper will be required to give a bond in the sum of $40,000, before he shall be allowed to enter on the performance of his duties.

After having complied with all the requirements of the above order, the successful candidates were duly appointed by the President, and commissioned accordingly.

The duties of the position are defined to be "under the direction of the Surgeon General and Medical Purveyors, with the storing and safe keeping of medical and hospital supplies, and with the duties of receiving, issuing and accounting for the same according to regulations."

The pay of the Storekeepers is $124.16 per month, with the allowances of quarters and fuel of a first lieutenant of the army, in kind only, which added to the pay, at the present market value, makes the total yearly pay about $1,750 (dollars).

There is no actual rank for storekeepers; by custom and courtesy those in the quartermaster's and ordnance departments are styled Captain, and the same title is at some posts adopted for medical storekeepers; at others they are simply addressed as "Mr.;" according as custom has established. The absence of any rank is a practical inconvenience, as no civilian in the army can com-

mand that subordination and respect from inferiors which attaches to actual and acknowledged rank in a superior.

A uniform has been established by regulations for storekeepers in the department to which they belong, but practically no attention is paid to it, each one wearing what fancy or convenience dictates, without any mark of rank, however.

Having no assimilated rank, they are not in the line of promotion; nor are they or their families entitled to any pensions or bounties under existing laws, should they be injured or killed, or die from disease contracted while in the line of their duty; the position being considered rather a civil than a military addition to the army.

The position of storekeeper is one of considerable magnitude and responsibility, the property passing through his hands, and for which he is accountable while in his care, amounts to millions of dollars annually.

The law requires him to receive, issue, and safely store it; he must keep an account with each item, and make returns quarterly, accounting for every ounce or yard or single thing that comes into his possession, and he must be sure, too, that he receives all he is charged with, by looking sharply after those who may be furnishing his depot with supplies; this for his own protection as well as for the Government.

Enough clerical assistance is allowed to perform the great amount of labor necessarily accumulating; system and economy are, however, rigidly enjoined, and no unnecessary expenses of any kind are allowed in the settlement of accounts with the Treasury. As he is responsible for the stores passing through or in his hands, he is also responsible for the honesty and efficiency of those employed by him, and can therefore appoint his own clerks.

When a requisition is received from a Surgeon in charge of a hospital, or of a regiment in the field, having first obtained the approval of the Medical Director of the Department in which it is located, it is at once packed—all the supplies being conveniently put up for issue according to the Supply Table—and marked ready for shipment, each package also being marked with the name of the class to which its contents belong. A packer's list, giving in detail the contents of each package, is sent by mail,

together with an invoice and blank receipt, to be filled up similar to the invoice and returned by the receiving officer.

The requisition, when thus ready for shipment, is sent to the quartermaster of the post, for transportation, who receipts to the storekeeper for the number of packages and their condition only; this relieves him from further responsibility as to the safety of the goods, and the quartermaster sees that they are properly delivered to the person making the requisition.

It so happened that four of the six medical storekeepers appointed as above authorized, were assigned to duty as Acting Medical Purveyors; this added largely to their duties and responsibilities; as they then became purchasing and disbursing officers, purchasing supplies in yearly value from half to two millions of dollars, and paying to the various claimants against the Army Medical Department, perhaps as much more, but with no extra compensation or emolument. The amount of pay seems small for such responsibilities and the heavy security demanded, and in reality is so, but when compared with that of officers in other departments whose duties are similar, it is equally good.

Scientific knowledge is not much called into play; what is most required is a thorough business knowledge, a familiarity with the various customs of ordinary business transactions, sound judgment, and intimate acquaintance with the regulations, laws, orders, and circulars of the medical department.

The purchase of medicines proper is a small part of the expenditures of the medical department, when compared to the purchase of Dry Goods, Hardware, Groceries, Liquors, Books and Stationery, &c., required in supplying hospitals, so that a varied business knowledge is necessary, to keep in view the constant market changes in the price and also in the quality of supplies required. I do not wish to convey the idea that an acquaintance with drugs is unimportant, but which is on the contrary absolutely necessary; hence the wisdom of appointing practical druggists to the positions.

As a new employment of Pharmaceutists, called into existance by the rebellion, the history of the medical storekeepers deserves mention in the annals of Pharmacy.*

* See remarks in the Editorial department on this subject.

# THE MEDICAL PURVEYING DEPARTMENT OF THE UNITED STATES ARMY.

By Hennell Stevens, Medical Storekeeper, U. S. A.

The duties and responsibilities of the Medical Department, of an army like that of the United States, engaged in a conflict so vast, and scattered over so large an extent of territory, must necessarily be varied and important. In point of numbers it is the largest of the Staff Corps. Upon it devolve the measures necessary for the prevention of disease, as well as its treatment and cure; the hygienic and sanitary regulations of the army; the planning of hospitals, and their superintendence; the purchase or manufacture, and distribution of medical supplies, as well as their administration to the sick. It is of the last class of duties alone of which I shall treat in the present paper, in which I propose to give some account of the operations of the Medical Purveying Department of the United States Army, believing it will be of interest to the readers of the Journal.

The duties of procuring and issuing the medical supplies of the army are devolved, under the direction of the Surgeon General, upon the Medical Purveyors, who are Medical Officers, detailed for that duty, there being, in our army, no officers appointed for that specific purpose. In May, 1862, Congress passed an Act, adding six Medical Storekeepers to the army, who were required to be skilled Apothecaries or Druggists; and who were appointed under the following regulations, published May 24th, 1862.

1st. A board of not less than three Medical Officers will be assembled by the Secretary of War to examine such applicants as may, by him, be authorized to appear before it.

2d. Candidates, to be eligible to examination, shall be not less than 25 years nor more than 40 years of age; shall possess sufficient physical ability to perform their duties satisfactorily; and shall present with their applications satisfactory evidence of good moral character.

3d. Candidates will be required to pass a satisfactory examination in the ordinary branches of a good English education, in Pharmacy and Materia Medica; and to give proof that they possess the requisite business qualifications for the position.

4th. The board will report to the Secretary of War the relative merits of the candidates examined, and they will receive appointments accordingly.

5th. When appointed, each Medical Storekeeper will be required to give a bond in the amount of $40,000, before he shall be allowed to enter on the performance of his duties.

Soon after their appointment, four of the Medical Storekeepers were assigned to duty as Medical Purveyors, and two of them still occupy that position, out of the five remaining in the corps. The relative duties of Medical Purveyors and Storekeepers will appear from the following extracts from official orders.

"Medical Purveyors are charged, under the direction of the Surgeon General, with the selection and purchase of all medical and hospital supplies for the Army. In all cases of emergency they may provide such additional accommodation for the sick and wounded of the Army, and may transport such medical and hospital supplies, as circumstances may render necessary. In all *cases of emergency* they shall promptly issue supplies on special requisitions made directly upon them, and such special requisitions shall consist simply of a list of the articles and quantities required, and be dated and signed by the Medical Officer who makes the requisition. The nature of the emergency must be stated, otherwise the requisition will be referred to the Medical Director.

Except in the "cases of emergency," referred to in the preceding paragraph, Medical Purveyors and Medical Storekeepers will issue medical and hospital supplies only on the order of the Surgeon General, the Assistant Surgeon General, or a Medical Director.

Medical Storekeepers are charged, under the direction of the Surgeon General and Medical Purveyors, with the storing and safe-keeping of medical and hospital supplies, and with the duties of receiving, issuing, and accounting for the same, according to regulations.

Medical Purveyors and Medical Storekeepers will be held responsible that the medical and hospital supplies issued or transferred by them, are well packed; that each article is designated by the name of the maker or vender; and that each package is legibly and correctly marked with the address of the officer for whom it is intended, and with its weight and contents, whether medicines, hospital stores, instruments, dressings, books and stationery, bedding, clothing, or furniture and appliances.

Medical Purveyors and Medical Storekeepers will give bonds in such sums as the Secretary of War may require, with security to be approved by him. Medical Officers, temporarily assigned to duty as Acting Medical Purveyors, are not required to give bonds."

Besides procuring and issuing medical supplies, Medical Purveyors are disbursing officers; being charged with the payment of accounts against the Medical Department, and also of contract Surgeons, and the civilians employed in hospitals as cooks and nurses. The principal purveying depots of the army are located

in New York and Philadelphia, each depot having connected with it a laboratory, where, as far as possible, the supplies required are manufactured, and put up for issue. The other depots are divided into Department and Field depots; the former being located at the most central point of each military department, the latter being in close proximity to the scene of active operations; and drawing their supplies from the former, who, in their turn, are supplied from the principal depots. Like ever thing else connected with the army, its medical supplies are on the most liberal scale.

"The standard of medical and hospital supplies for the Army is the Supply Table. It is not the design of the Department to confine medical officers absolutely to that table, either in variety or quantity, but only to establish a standard for their guidance in making requisitions for supplies, leaving individual preferences to be indulged at the discretion of the Medical Director or the Surgeon General. Neither is it supposed that the quantities of the table will always meet the necessities of unusual emergencies, as during epidemics, or in unhealthy seasons and localities; and medical officers who allow their supplies to be exhausted through any such contingencies, without timely notice of their approaching necessities, will be held to a strict accountability."

The Supply Table is as follows:—

STANDARD SUPPLY TABLE FOR THREE MONTHS.

(1.) *For Hospital of* 100 *Beds.*
(2.) *For* 1000 *men in the field.*

| ARTICLES. | Quantities. 1. | 2. | ARTICLES. | Quantities. 1. | 2. |
|---|---|---|---|---|---|
| *Materia Medica.* | | | Ammoniæ Murias.....oz. | 8 | |
| Acaciæ Pulvis.....oz. | 32 | 8 | Spiritus Aromaticus, oz. | 4 | 4 |
| Acidum Aceticum.....oz. | 8 | | Argenti Nitras.....oz. | 2 | 1 |
| Citricum.....oz. | 16 | | Fusa.....oz. | 2 | 1 |
| Muriaticum.....oz. | 8 | | Arsenitis Potassæ Liquor.....oz. | 4 | |
| Nitricum.....oz. | 8 | | Assafœtida.....oz. | 4 | |
| Phosphoricum Dilutum.....oz. | 2 | | Bismuthi Subcarbonas.....oz. | 2 | |
| Sulphuricum.....oz | 8 | | Camphora.....oz. | 8 | 8 |
| Aromaticum, oz. | 16 | 8 | Cantharidis Pulvis.....oz. | 2 | |
| Tannicum.....oz. | 4 | 1 | Ceratum.....oz. | 24 | 6 |
| Tartaricum.....oz. | 32 | | Capsici Pulvis.....oz. | 8 | 8 |
| Æther Fortior.....oz. | 64 | 32 | Catechu.....oz. | 8 | |
| Ætheris Spiritus Compositus oz. | 16 | 16 | Cera Alba.....oz. | 32 | 4 |
| Nitrici.....oz. | 48 | 32 | Ceratum Adipis.....lbs. | 10 | 4 |
| Alcohol Fortius.....bott. | 24 | 6 | Resinæ.....lbs. | 2 | 1 |
| Aloe Pulvis.....oz. | 2 | | Cinchonæ Calisayæ Pulvis...oz. | 16 | |
| Alumen.....oz. | 16 | 8 | Cinchoniæ Sulphas.....oz. | 40 | 24 |
| Ammoniæ Carbonas.....oz. | 16 | 8 | Chlorinium, (the materials for preparing) in a package no. | 1 | |
| Aqua.....oz. | 96 | 32 | Chloroformum.....oz. | 32 | 32 |

| ARTICLES. | Quantities. 1. | 2. |
|---|---|---|
| Collodium | oz. 2 | 1 |
| Copaiba | oz. 64 | 16 |
| Creasotum | oz. 4 | 4 |
| Creta Preparata | oz. 16 | |
| Cubebæ, Oleo-resina | oz. 8 | |
| Cupri Sulphas | oz. 2 | 2 |
| Extract Aconiti Radicis Fluidum | oz. 8 | 8 |
| Extract Belladonnæ | oz. 1 | 1 |
| Buchu Fluidum | oz. 16 | |
| Cinchonæ Fluidum | oz. 16 | 16 |
| Colchici Sem. Fluidum | oz. 8 | 8 |
| Colocynthid. Compos | oz. 8 | 8 |
| Conii | oz. 1 | |
| Ergotæ Fluidum | oz. 2 | |
| Gentianæ Fluidum | oz. 16 | |
| Glycyrrhizæ | oz. 64 | |
| Hyoscyami | oz. 1 | |
| Ipecac. Fluidum | oz. 8 | 8 |
| Nucis Vomicæ | oz. 1 | |
| Pruni Virg. Fluidum | oz. 8 | |
| Rhei Fluidum | oz. 8 | |
| Senegæ Fluidum | oz. 8 | 8 |
| Spigeliæ Fluidum | oz. 8 | |
| Valerianæ Fluidum | oz. 8 | |
| Veratri Viridis Fluid | oz 2 | |
| Zingiberis Fluidum | oz. 16 | 16 |
| Ferri Chloridi Tinctura | oz. 16 | 8 |
| Iodidi Syrupus | oz. 16 | |
| et Quiniæ Citras | oz. 4 | 1 |
| Persulphatis Liquor | oz. 4 | 4 |
| Pulvis | oz. 1 | 1 |
| Sulphas | oz. 4 | |
| Oxidum Hydratum (the materials for) in p'kg. | no. 1 | |
| Glycyrrhizæ Pulvis | oz. 8 | |
| Glycerina | oz. 16 | 8 |
| Hydrargyri Chlorid. Corr | oz. 1 | |
| Chloridum Mite | oz. 1 | |
| Iodidum Flavum | oz. 1 | |
| Oxidum Rubrum | oz. 1 | |
| Pilulæ | oz. 8 | 8 |
| Unguentum | lbs. 1 | 1 |
| Nitratis, | oz. 4 | 4 |
| Iodinium | oz. 4 | 2 |
| Ipecacuanhæ Pulvis | oz. 8 | 8 |
| et Opii Pulvis | oz. 8 | 8 |
| Linum | lbs. 6 | |
| Lini Pulvis | lbs. 16 | 8 |
| Magnesia | oz. 8 | |
| Magnesiæ Sulphas | lbs. 16 | 8 |
| Morphiæ Sulphas | oz. ½ | ½ |
| Olei Menthæ Pip. Tinct | oz. 1 | |
| Oleum Cinnamomi | oz. 16 | |

| ARTICLES. | Quantities. 1. | 2. |
|---|---|---|
| Oleum Morrhuæ | bott. 16 | |
| Olivæ | bott. 4 | 2 |
| Ricini | bott. 8 | 4 |
| Terebinthinæ | bott. 2 | 1 |
| Tiglii | oz. 1 | 1 |
| Opii Pulvis | oz. 8 | 8 |
| Tinctura | oz. 16 | 16 |
| Camphorata | oz. 16 | 16 |
| Pilulæ Camphoræ et Opii | doz. 8 | 8 |
| Cathartice Compos. | doz. 8 | 8 |
| Opii | doz. | |
| Plumbi Acetas | oz. 8 | 4 |
| Podophylli Resinæ | oz. 1 | |
| Potassæ Acetas | oz. 8 | |
| Bicarbonas | oz. 8 | 8 |
| Bitartras | oz. 16 | |
| Chloras | oz. 16 | 8 |
| Nitras | oz. 8 | |
| Potassii Iodidum | oz. 24 | 8 |
| Quiniæ Sulphas | oz. 20 | 10 |
| Rheum | oz. 4 | |
| Rhei Pulvis | oz. 4 | |
| Sapo | lbs. 8 | 4 |
| Scillæ Pulvis | oz. 4 | 2 |
| Syrupus | lbs. 8 | 4 |
| Sinapis Nigræ Pulvis | lbs. 8 | 4 |
| Sodæ Chlorinatæ Liquor | lbs. 8 | 1 |
| Bicarbonas | oz. 16 | 8 |
| Boras | oz. 8 | |
| et Potassæ Tartras | oz. 32 | 16 |
| Spiritus Lavandulæ Compos. | oz. 16 | |
| Frumenti | bott. 72 | 24 |
| | galls. | |
| Vini Gallici | bott. 12 | 6 |
| Sulphur | oz. 16 | |
| Strychnia | oz. ½ | |
| Vinum Xericum | bott. 24 | |
| Zinci Acetas | oz. 2 | |
| Carbonas | oz. 1 | |
| Chloridi Liquor | oz. 48 | 16 |
| Sulphas | oz. 2 | 1 |
| *Hospital Stores.* | | |
| Barley | lbs. 10 | |
| Beef, Extract of | lbs. 24 | 24 |
| Candles, Sperm or Compos. | lbs. 2 | 2 |
| Cinnamon, Powdered | lbs. ½ | |
| Cocoa or Chocolate | lbs. 10 | |
| Coffee, Extract of | galls. | 4 |
| Corn Starch | lbs. 10 | |
| Farina | lbs. 10 | |
| Gelatine Shred | lbs. 1 | |
| Ginger, Powdered | lbs. ½ | |
| Milk, Concentrated | lbs. | 16 |

| ARTICLES. | Quantities. 1. | 2. |
|---|---|---|
| Nutmegs ..... lbs. | ¼ | ¼ |
| Pepper, Black, Ground..... lbs. | 1 | |
| Porter, in Pint Bottles..... botts. | 96 | |
| Casks ..... galls. | | |
| Sugar, White, Crushed..... lbs. | 24 | 12 |
| Tea, Black or Green..... lbs. | 15 | 5 |
| Tapioca..... lbs. | 8 | |
| Ice..... lbs. | | |
| *Instruments.* | | |
| Cupping Glasses, ass'd sizes, no. | 12 | |
| Tins ..... no. | 12 | 12 |
| Dissecting Instruments..... case. | 1 | |
| Field Case..... case. | | 1 |
| Lancets, Thumb..... no. | 2 | 2 |
| Obstetrical Case..... case. | | |
| Pocket Case..... case. | 1 | 1 |
| Probangs..... no. | 6 | 6 |
| Scarificator ..... no. | 2 | 2 |
| Scissors, large and small..... no. | 2 | 2 |
| Speculum, for the ear..... no. | 1 | |
| for the vagina, glass no. | | |
| Sponge holder for the throat no. | 1 | 1 |
| Stethoscope..... no. | 1 | |
| Stomach Pump, in case..... no. | | |
| Tube..... no. | 1 | 1 |
| Syringes, Rubber, self-injecting, No. 1..... no. | 2 | 2 |
| Hard Rubber, 8 oz..no. | 1 | |
| 4 oz..no. | | |
| univers'l, no. | | 1 |
| Hypodermic 3 points, no. | 1 | |
| Penis, glass, in cases, no. | 6 | 6 |
| Vagina, rubber, 1 } glass, 2.. } case. | | |
| Teeth Extracting Instr..... case. | 1 | 1 |
| Tongue Depressor, hinged...no. | 1 | 1 |
| Tourniquets, Field..... no. | | 8 |
| Screw, with pad, no. | 1 | 2 |
| Trusses, Inguinal, double....no. | 1 | |
| single..... no. | 3 | 4 |
| Vaccinator, (Spring)..... no. | | 1 |
| Vaccine Virus, Crusts..... no. | | |
| *Dressings, etc.* | | |
| Adhesive Plaster..... yds. | 10 | 5 |
| Binders' Boards..... pcs. | 12 | 16 |
| Cotton, Bats..... no. | 2 | 2 |
| Wadding..... sheets | 2 | 1 |
| Flannel, Red..... yds. | 4 | 4 |
| Gutta Percha Cloths..... yds. | 4 | 2 |
| Ichthyocolla Plaster..... yds. | 4 | 5 |
| Lint, Patent..... lbs. | 4 | 4 |
| picked or scraped, linen, lbs. | 2 | 2 |
| Muslin, Bleached..... yds. | 20 | 10 |
| Napkins for Ophthalmia..... no. | 12 | |
| Needles 25, cotton 1 spool, | | |
| thimble 1, in case..... no. | 2 | 1 |
| Oakum, Fine, Picked..... lbs. | 10 | 5 |
| Oiled Muslin..... yds. | 2¼ | 2¼ |
| Silk..... yds. | 2¼ | 2¼ |
| Pencils, Hair, assorted sizes..no. | 12 | 12 |
| Pins..... papers. | 2 | 2 |
| Roller Bandages, assorted....doz. | 16 | 16 |
| Silk, Green, for shades..... yds. | 1 | 1 |
| Saddlers, for ligatures..oz. | ¼ | ¼ |
| Splints, in one package..... set. | 1 | 1 |
| Smith's anterior..... no. | 3 | 3 |
| Sponge, Fine ..... oz. | 8 | 8 |
| Suspensory Bandages..... no. | 4 | 8 |
| Tape, Cotton..... pieces. | 3 | 3 |
| Woolen..... pieces. | 1 | 1 |
| Thread, Linen..... oz. | 2 | 1 |
| Tow ..... lbs. | 2 | 10 |
| Towels ..... doz. | 5 | 2 |
| Roller..... doz. | 2 | |
| Twine, one-half coarse..... oz. | 16 | 8 |
| *Books and Stationery, &c.* | | |
| Anatomy ..... cop. | 1 | |
| Surgical, (of Arteries) cop. | | 1 |
| Chemistry ..... cop. | 1 | |
| Dictionary, Medical..... cop. | 1 | |
| English ..... cop. | 1 | |
| Dispensatory..... cop | 1 | 1 |
| Hygiene..... cop. | 1 | 1 |
| Jurisprudence..... cop. | 1 | |
| Midwifery..... cop. | | |
| Pathology..... cop. | 1 | |
| Pharmacy ..... cop. | 1 | |
| Physiology..... cop | 1 | |
| Practice of Medicine..... cop. | 2 | |
| Principles of Medicine..... cop. | 1 | |
| Surgery, Principles of..... cop. | 1 | |
| McLeod's Surg. Motes, cop. | 1 | |
| Guthrie's Commentr's cop. | 1 | |
| Minor ..... cop. | 1 | 1 |
| Therapeutics..... cop. | 1 | |
| Longmore on Gun-shot Wounds..... cop. | 1 | |
| Jones on Diseases of the Eye cop. | 1 | |
| Toynbee on Diseases of the Ear ..... cop. | 1 | |
| Wilson on Diseases of the Skin ..... cop. | 1 | |
| Bumstead on Venereal Diseases ..... cop. | 1 | |
| Hospital Steward's Manual cop. | 1 | 1 |
| Blank Books, cap, hf. bd., | | |
| 4 qrs ..... no. | 4 | 2 |

| ARTICLES. | Quantities. 1. | 2. |
|---|---|---|
| Case Book.....no. | 1 | |
| Envelopes, printed, assorted no. | 100 | 100 |
| Ink, 2 oz. bottles.....no. | 3 | 2 |
| Inkstands .....no. | 2 | |
| Travelling.....no. | | 1 |
| Meteorological Register.....no. | | |
| Morning Report Book.....no. | 1 | 1 |
| Mucilage.....bott. | 1 | 1 |
| Order and Letter Book.....no. | 1 | |
| Prescription Book, Ward....no. | 2 | 2 |
| Register of Sick & Wounded..no. | 1 | |
| Surgical Operations no. | 1 | |
| Regulations, Army.....cop. | 1 | |
| Med. Departm't, cop. | 1 | 1 |
| Paper, Filtering.....packs. | 1 | |
| Wrapping.....qrs. | 4 | 2 |
| Writing, assorted.. qrs. | 8 | 4 |
| Pens, steel.....no. | 24 | 24 |
| Penholders .....no. | 4 | 2 |
| Pencils, Lead.....no. | 6 | 6 |
| Portfolio, cap size.....no. | 1 | 1 |
| Sealing Wax.....sticks. | 1 | 1 |
| Blanks.....no. | | |
| *Bedding.* | | |
| Bed Sacks.....no. | 112 | 15 |
| Beds, Water, of India-rubber no. | | |
| Blankets.....no. | 200 | 30 |
| Blanket Cases.....no. | | 3 |
| Counterpanes.....no. | 112 | |
| Cushions, rubber, air or water, with open centre....no. | 2 | |
| Cushions, rubber, small, air or water.....no. | 4 | |
| Gutta Percha Bed Covers.....no. | | 8 |
| Mattresses, Hair.....no. | 10 | |
| straw, moss, or chuck no. | 100 | |
| Mosquito Bars.....no. | 100 | |
| Pillows, Hair.....no. | 112 | |
| Pillow Cases, Cotton, Col'rd no. | | 15 |
| Linen .....no. | 148 | |
| Ticks.....no. | | 15 |
| Sheets, Linen.....no. | 400 | |
| *Hospital Clothing.* | | |
| Caps, Cotton.....no. | 100 | |
| Drawers.....no. | 200 | |
| Gowns, Dressing.....no. | 100 | |
| Shirts, Cotton.....no. | 200 | |
| Slippers.....no. | 100 | |
| Socks, Woolen.....no. | 200 | |

| ARTICLES. | Quantities. 1. | 2. |
|---|---|---|
| *Furniture and Appliances.* | | |
| CLASS No. 1. | | |
| Basins, Tin, small, for dressers.....no. | 4 | 4 |
| Wash, Hand.....no. | 16 | 4 |
| Bed Pans, Delf.....no. | 2 | 1 |
| Screens.....no. | 2 | |
| Bedsteads, Iron.....no. | 100 | |
| Bed Ticket Frames.....no. | 100 | |
| Brooms.....no. | 4 | |
| Brushes, Scrubbing.....no. | 4 | |
| Buckets, Wooden.....no. | 4 | |
| Leather.....no. | | 2 |
| Candlesticks.....no. | 8 | |
| Caldrons, 20 gallons.....no. | | |
| Chairs.....no. | 24 | |
| Clocks.....no. | 2 | |
| Clothes-line.....feet. | 300 | |
| Close Stools.....no. | 2 | |
| Corks, assorted.....doz. | 12 | 6 |
| Corkscrews .....no. | 2 | 1 |
| Feeding Cups.....no. | 4 | |
| Funnels, Glass, half-pint....no. | 2 | |
| Tin, pint.....no. | 2 | 1 |
| Graters, Nutmeg and large..no. | 2 | 1 |
| Hatchet .....no. | 1 | 1 |
| Hone.....no. | 1 | 1 |
| Lanterns, Glass.....no. | 2 | 3 |
| Litters, Hand.....no. | 4 | 4 |
| Horse.....no. | | 2 |
| Looking-Glasses.....no. | 4 | |
| Measures, graduated, glass, 4 oz. .....no. | 2 | 1 |
| Measures, graduated, glass, minim.....no. | 2 | 1 |
| Tin, gall. to pint..no. | 1 | |
| Medicine Case.....no. | | 2 |
| Panniers.....no. | | 2 |
| Measuring Glasses.no. | 4 | 2 |
| Spoons, Delf.....no. | 4 | |
| Mess Chest.....no. | | 1 |
| Mortar & Pestle, Wedgwood no. | 2 | 1 |
| Pill Boxes, wood.....papers. | 4 | 2 |
| Machine.....no. | 1 | |
| Tile.....no. | 2 | 1 |
| Pots, Chamber, Delf.....no. | 10 | |
| Inodorous, Delf.....no. | 2 | |
| Rain Guage.....no. | | |
| Range, with fixtures, &c.....no. | | |
| Razor and Strop, in case....no. | 1 | 1 |
| Retort, Delf, one quart.....no. | 1 | |
| Sad-Irons.....no. | 4 | |
| Scales & Weights, Prescript.no. | 1 | 1 |
| Shop.....no. | 1 | |
| Sheepskins, Dressed.....no. | 9 | 4 |

| ARTICLES. | Quantities. 1. | 2. |
|---|---|---|
| Slates.....no. | 1 | |
| Spatulas, 3-inch and 6-inch, no. | 2 | 2 |
| Spirit Lamp.....no. | 1 | |
| Spit Mugs, without top.....no. | 6 | |
| Spittoons.....no. | 12 | |
| Stoves, Cooking, with fixt'rs no. | 1 | |
| Tables, Bedside.....no. | 50 | |
| Test Tubes.....no. | 6 | |
| Thermometer.....no. | 1 | |
| and Hygrometer, no. | 1 | |
| Tin Warmer, for Stomach...no. | 1 | |
| for Feet.....no. | 1 | |
| Tubs, Bath.....no. | 1 | |
| Urinals, Glass.....no. | 2 | |
| Vials, assorted.....no. | 8 | |
| Wood-Saws.....doz. | 1 | |
| CLASS No. 2. | | |
| Bowls, Delf.....no. | 60 | |
| Cleavers.....no. | 1 | |
| Dippers, Tin.....no. | 2 | |
| Dishes, assorted.....no. | 14 | |
| Flesh Forks.....no. | 1 | |
| Gridirons.....no. | 2 | |
| Kettles, Tea, Iron.....no. | 2 | |
| Knives & Forks, of each.....no. | 60 | |
| Carving, of each, no. | 2 | |
| Bread .....no. | 1 | |
| Butcher's.....no. | 1 | |
| Ladles.....no. | 2 | |
| Mugs, Delf.....no. | 60 | |

| ARTICLES. | Quantities. 1. | 2. |
|---|---|---|
| Pans, Frying.....no. | 1 | |
| Sauce.....no. | 2 | |
| Tin.....no. | 2 | |
| Pitchers, Delf.....no. | 6 | |
| Plates, Delf.....no. | 60 | |
| Pots, Coffee, Tin.....no. | 4 | |
| Mustard.....no. | 2 | |
| Pepper.....no. | 2 | |
| Tea, Delf.....no. | 4 | |
| Salt-Cellars.....no. | 6 | |
| Spoons, Table .....no. | 60 | |
| Tea.....no. | 60 | |
| Steel.....no. | 1 | |
| 2 Trays, Butler's.....no. | 2 | |
| 2 Tumblers, Glass.....no. | 12 | |
| "Carbolic acid, (Bower's,) sulphate of iron, nitrate of lead, chlorinated lime, permanganate of potash, or charcoal, will be furnished as antiseptics or disinfectants, when required. | | |
| "Applications for microscopes by medical officers in charge of general hospitals will be favorably considered, provided the evidence be satisfactory that the officer will use the instrument for the benefit of science, and will report the results of his observations to the Surgeon General." | | |

In addition to the articles enumerated, Ice is fully supplied to the sick. The quantity issued at Memphis, for the year ending May 31st, 1864, being no less than 4908 tons. The manner of issuing supplies is laid down in official regulations, as follows:—

"Medical Purveyors and Medical Storekeepers at depots for issue, and at field depots, and the senior medical officers of hospitals, regiments, posts, or detached commands, will make their requisitions for medical and hospital supplies upon the Medical Director, under whom they may be serving. The Medical Director will approve or modify the requisitions at his discretion; and, in ordinary cases, will transmit them to the nearest Purveyor or Medical Storekeeper, with his order for the supplies. If, however, the amount required be large, and the situation and nature of the service permit, the Medical Director will transmit the requisitions, with his recommendations indorsed thereon, to the Surgeon General.

Requisitions for outfits of medical and hospital supplies will be made for three months, and in the form of a letter, stating the number of men

or beds to be supplied, and whether for general hospitals, permanent posts, or field service. If for permanent posts, the amount of hospital accommodations must be stated, so that if less than one hundred beds, the allowance of bedding, hospital clothing, furniture and appliances, may be correspondingly reduced.

Requisitions to replenish medical and hospital supplies will always be made in detail, according to form 8, and for those articles only that are really deficient in quantity. If the supplies are to be obtained from the principal purveying depots, these requisitions will be made quarterly; if from department or field depots, they will be made at such times and for such periods as the Medical Director may prescribe. Special requisitions are not intended to take the place of the regular quarterly requisition. They are only permissible in cases of emergency; and the face of the requisition must state the circumstances which constitute the emergency, rendering such special requisition necessary."

Department and Field depots receive their medical supplies put up in packages, thereby greatly facilitating their operations, and making it but the work of a few hours to fit out a whole division, or to start a hospital of a thousand beds. The system of accountability is rigid and thorough, the Surgeon General being daily informed of every issue of whatever kind; and all officers receiving medical supplies being required to account for each and every article received.

*Memphis, Tenn., Feb.*, 1865.

---

## ON PULV. JACOBI VERUS.

*Cincinnati, Ohio,* Jan. 30th, 1865.

PROF. PROCTER:

*Dear Sir,*—Inclosed I send you an ancient piece of pharmaceutical literature, to which I have added the translation. I thought from the celebrity this powder has, that the original formula might not be uninteresting to your readers. Dr. James undoubtedly intended the old formula more for fevers than a simple diaphoretic—malignant fevers at that time greatly prevailing. But I believe that he must have subsequently abandoned the latter part of the preparation. The quantities used, and the proper way to make it, James undoubtedly kept a secret in his family—the grandson being the present maker—as no preparation like it has ever been made that has shown the uniform effect it does, besides leaving no irritation on the bowels, which all other antimonial powders do, especially on patients residing in hot climates.

I have for the last ten years used the "Pulv. Jacobi Verus" in my practice with great success, especially in pneumonia of children, &c.; and many of my colleagues here, have since adopted it with great satisfaction.

Newberry & Son's preparation is next in effect to James's, and in small doses, have thought it equal to it; but when you have to give from ten to twenty grains, none can compare to James's. I have always been able to detect when a spurious article was substituted in any of my prescriptions, by finding my patient immediately nauseated, with griping of the bowels, and frequently severe purging ensued.

Very truly yours, DR. J. S. UNZICKER.

*Pulv. Jacobi Verus—or James's Powder.*

As given by Donald Monro, in the Pharmacopœia Universalis, page 264. Extracted from the Records of Chancery, London. Signed and sworn to by *Robert James*. 1746.

R. Sulphureti Antimonii quantum vis. Calcino in crucibello, parvam Natri nitrici copiam, et Oli Animale Dippeli guttas aliquot addendo, donec massa alba evaserit; tum Nitri parvam copiam adde et liqua; ab igne remotum lave Aqua calida et sicca residuum.

Quo facto amalgama e Mercurii, Argenti et Reguli Antimonii martialis partibus æqualibus, addita Salis Ammoniaci quantitate sufficiente, paratum infunde supra novam Argenti, Antimonii et Salis copiam, quam operationem octis et novis repete. Tum ut solvatur, in Acidum Nitricum purum immette, decantha sedulo, et evaperato, residuum calcina usque colorem aureum obtinuerit et in Alcohole lava, quo facto hujus producti granum cum granis triginta illius e calcinatione sulphureti commisce.

Take Sulphuret of Antimony, as much as you like, a small quantity of Nitrate of Soda, and drop in some Animal Oil of Dippel, calcine in a crucible until the mass is white; after which add a small quantity of Nitre and bring it to a flux; then remove from the fire, wash with warm water and dry the residue.

After this is done amalgamate equal parts of Quicksilver, Silver, and metallic Antimony, adding a sufficient quantity of Sal-Ammoniac. When ready, pour over a new quantity of Silver, Antimony and Salt;* this operation repeat eight or nine times. Then dissolve in pure Nitric Acid, decant the liquid carefully from the sediment and evaporate and calcine the residue until it assumes a golden color, and wash in Alcohol; of this, in this way prepared product, mix a grain with thirty grains of the above sulphurated calcination.

* [NOTE.—In some versions of this recipe, the amalgam is directed to be distilled, and the mercury returned and re-distilled eight or nine times.—ED. AM. J. PH.]

## ON THE PREPARATION OF HEAVY OIL OF WINE.

By J. M. Maisch.

The formation of ether from sulphuric acid and alcohol has led many chemists to study the effects of this acid on a limited quantity of alcohol; and many researches are recorded, detailing the results obtained with the condensable and incondensable portion of the distillate, and with the residue left in the retort. The condensable portion of the distillate consists of alcohol, if an excess of it has been used, ether, water, heavy oil of wine, and a little acetic acid; and contains a considerable quantity of sulphurous acid in solution. It is evident that the temperature must have a great influence on the relative proportion of these products, and it is to be regretted that but few observations on this point have been made.

Kuhlmann states that equal parts of alcohol and sulphuric acid, heated to 165° C. (329° F.) yield ether and water; above that point water, sulphurous acid, elayl, oil of wine, and a little acetic acid. (Ann. d. Pharm., xxxiii. 217.)

Marchand (Jour. f. pr. Chem., xv. 13,) obtains from the same mixture, between 120 and 165° C., (248 and 329° F.) alcohol, ether, and water: between150 and 160° C. ether and water only; between 160 and 165° C. (320 and 329° F.,) elayl, sulphurous and carbonic acid, and a little ether, which disappears altogether above 175° (347° F.), leaving only the gases, water, and heavy oil of wine, as the products of distillation.

By passing the vapors of absolute alcohol through sulphuric acid, kept at 160° C. (220° F.) Lose (Poggend. Annalen, xlvii. 619,) obtained elayl and sulphurous acid gas, water, and heavy oil of wine. The retort contains sulphuric, isethionic, and thiomelanic acids.

Mitscherlich (N. Ann. d. Chem. und Phys., vii. 12,) passed through a mixture of 10 p. sulphuric acid and 3 p. water, which boils between 160 and 165° C., the vapors of 80 per ct. alcohol, whereby this latter was almost completely decomposed into water and elayl (olefiant gas), containing but little alcohol and traces of ether; the residue in the retort was colorless.

If the results of the experiments of Lose and Mitscherlich are compared, we are struck at once with the great difference produced by the presence of water in the sulphuric acid and

alcohol, whereby the formation of oil of wine is entirely prevented. The conclusion must, therefore, be arrived at, that the absence of water, the generation of sulphurous, and the formation of thiomelanic acid, are requisite to the formation of the heavy oil of wine.

On heating a mixture of sulphuric acid and alcohol, sulphovinic acid is formed. By heating sulphuric acid to 150° C. (302° F.,) and dropping nearly concentrated sulphovinic acid upon it, a black mass, undoubtedly thiomelanic acid, and heavy oil of wine, are separated, while sulphurous acid is given off. This observation of Duflos gives the lowest temperature as yet noticed in the formation of heavy oil of wine, and it agrees pretty well with the observations of Mr. C. Lewis Diehl, Jr., made at the U. S. Army Laboratory at Philadelphia, and which are published in the Proceedings of the American Pharmaceutical Association for 1864, p. 309. [See p. 126 of this number.]

A slight error has crept into that paper, which, though it scarcely affects the results, and has no influence on his deductions, needs correction. Towards the close of his paper, Mr. Diehl states that the amount of alcohol, spec. grav. ·809, consumed, was 367¾ gallons. The alcohol used was commercial 95 per cent. alcohol, which has generally a specific gravity of 817, but is occasionally as low as ·815. One gallon of alcohol, spec. grav. ·817, weighs 6·808 lbs.; the amount consumed by Mr. Diehl weighed, therefore, 2503·64 lbs.; the yield of oil was 558⅛ oz., or one ounce avoird. for 71·77 ounces avoird. of the alcohol.

Since the paper above alluded to was written, Mr. Diehl has made another series of distillations, the results of which, at my request, he has put into tabular form, which I herewith present. The great care taken in noting down his observations is very commendable, and it will be seen at a glance that, practically, these numerous figures are more valuable than pages of theoretical reasoning.

In explanation of the table, it is only necessary to state that the columns 1st, 2d, &c. heating, contain the highest temperature to which the mixture rose, and the lowest to which it fell, before it was re-heated.

*Observations on Oleum Æthereum, at the U. S. Army Laboratory, Philadelphia, Pa.*, 1864.

| DATE. | Numbers. | Charge. | Fires Started. | Boiling (bubbles) | Boiling (active.) | Reached 300° F. | First Heat. | Second Heat. | Third Heat. | Fourth Heat. | Fifth Heat. | Sixth Heat. | Highest Point attained. | Lowest point after rising to 300° | No. of reheatings | Boiled over. | Heating discontinued & temp. at 300°. | Number of hours distilled. | Yield. | Amount of $SO_3$ to 1 oz. of Ol. Æthereum. | Amt. of Alcohol to 1 oz. av. Ol. Æth. (meas.) | Amt. of Alcohol to 1 oz. av. Ol. Æth. (weight.) | Percentage of Oil of the Weight of alcohol used. | Specific gravity of Ol. Æthereum. | REMARKS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1864. | | c. g. | A.M. | ° F. | ° F. | A.M. | ° F | ° F. | ° F. | ° F. | ° F. | ° F | ° F. | ° F. | | P.M. | P.M. | | oz | oz. | fld. oz. | oz. | | 60° F. | |
| October 17.... | 1 | 7½ | 7.30 | 222 | 235 | 9.15 | 311 | 314 | 312 | 312 | 310 | 310 | 314 | 300 | 5 | | 6 | 8.45 | 6½ | 139.20 | 74.08 | 59.93 | 1.668 | 1.075 | Distillation proceeded properly. |
| " 17.... | 2 | 5½ | 7.30 | 220 | 242 | 9.45 | 307 | 307 | 300 | 302 | 304 | ... | | | | | | | | | | | | | |
| " 19.... | 3 | 7½ | 7.15 | 212 | 236 | 8.50 | 307 | 310 | 315 | 312 | 310 | 310 | 315 | 298 | 5 | | 6 | 8.15 | 5½ | 125.71 | 67.049 | 54.24 | 1.843 | 1.075 | " " " |
| | | | | | | | 302 | 301 | 298 | 304 | 304 | ... | | | | | | | | | | | | | |
| " 19.... | 4 | 5½ | 7.15 | 230 | 246 | 9.05 | 308 | 310 | 312 | 314 | 314 | 308 | 314 | 304 | 5 | | 5.15 | 8.25 | 7 | 128.57 | 68.57 | 55.47 | 1.802 | 1.075 | " " " |
| | | | | | | | 304 | 305 | 304 | 306 | 305 | .. | | | | | | | | | | | | | |
| " 21.... | 5 | 7 | 7 | 230 | 249 | 8.30 | 312 | 317 | 321 | 318 | ... | ... | 321 | 300 | 3 | | 5.15 | 8.10 | 5½ | 114.78 | 61.21 | 49.51 | 2.019 | 1.075 | Indications of frothing. |
| | | | | | | | 302 | 300 | 300 | ... | ... | ... | | | | | | | | | | | | | |
| " 21.... | 6 | 5½ | 7 | 248 | 270 | 8.45 | 312 | 315 | 315 | 313 | 313 | ... | 315 | 302 | 4 | | 5 | 9 | 6½ | 129.23 | 68.92 | 55.75 | 1.793 | 1.080 | Distillation proceeded properly. |
| | | | | | | | 305 | 304 | 303 | 302 | ... | ... | | | | | | | | | | | | | |
| " 21.... | 7 | 7½ | 7.30 | 228 | 246 | 8.55 | 318 | 317 | 315 | 311 | 313 | ... | 318 | 302 | 4 | | 5.30 | 9.15 | 5 | 126.00 | 67.20 | 54.36 | 1·839 | 1.080 | " " " |
| | | | | | | | 303 | 302 | 304 | 303 | ... | ... | | | | | | | | | | | | | |
| " 24.... | 8 | 5 | 7.30 | 230 | 260 | 9.10 | 310 | 314 | 316 | 312 | ... | ... | 316 | 304 | 3 | | 5.30 | 8.35 | 6½ | 139.20 | 74.08 | 59.93 | 1,668 | 1.075 | Indications of frothing. |
| | | | | | | | 305 | 304 | 304 | ... | ... | ... | | | | | | | | | | | | | |
| " 24.... | 9 | 7 | 7 | 238 | 250 | 8.30 | 325 | 324 | ... | ... | ... | ... | 325 | 298 | 2 | 4.20 | 4.20 | 7.10 | 6 | 100.00 | 56.00 | 45.30 | 2.207 | 1.075 | Ran over on second raising of heat. |
| | | | | | | | 301 | 298 | ... | ... | ... | ... | | | | | | | | | | | | | |
| " 26.... | 10 | 5½ | 7 | 238 | 258 | 8.25 | 318 | 318 | 314 | 306 | ... | ... | 318 | 298 | 3 | | 4 20 | 7.50 | 6½ | 124.44 | 66.37 | 53.69 | 1.862 | 1·080 | Indications of frothing. |
| | | | | | | | 303 | 300 | 298 | ... | ... | ... | | | | | | | | | | | | | |
| " 26.... | 11 | 7 | 7 | 230 | 260 | 8.30 | 320 | 320 | 315 | 310 | ... | ... | 320 | 303 | 3 | | 4.20 | 7.55 | 5½ | 120.19 | 64.00 | 51.77 | 1.951 | 1.080 | " " " |
| | | | | | | | 304 | 304 | 303 | ... | ... | ... | | | | | | | | | | | | | |
| " 28.... | 12 | 5½ | 7 | 238 | 258 | 8.20 | 314 | 319 | 319 | 312 | ... | ... | 319 | 302 | 3 | | 3.55 | 7.25 | 7½ | 115.84 | 61.931 | 50.021 | 1.999 | 1.0875 | " " " |
| | | | | | | | 303 | 302 | 305 | ... | ... | ... | | | | | | | | | | | | | |
| " 28.... | 13 | 7 | 8.45 | 228 | 254 | 1020 | 319 | 334 | 314 | ... | ... | ... | 334 | 302 | 2 | | 12.30 | 4.10 | 5 | 126.00 | 67.20 | 54.36 | 1.839 | 1.0875 | " " " |
| | | | | | | | 303 | 302 | ... | ... | ... | ... | | | | | | | | | | | | | |
| " 31.... | 14 | 5½ | 7.15 | 240 | 258 | 8.45 | 310 | 316 | 320 | ... | ... | ... | 320 | 304 | 2 | | 4.25 | 6.05 | 7 | 120.00 | 64.00 | 51.77 | 1.931 | 1.085 | Frothed very high. |
| | | | | | | | 305 | 304 | ... | ... | ... | ... | | | | | | | | | | | | | |
| November 2... | 15 | 7 | 7 | 241 | 270 | 8.55 | 317 | 319 | 319 | ... | ... | ... | 319 | 305 | 2 | 12.35 | 12.35 | 3.55 | 4½ | 132.88 | 70.63 | 57.13 | 1.750 | 1.085 | Ran over very early. |
| | | | | | | | 305 | 305 | ... | ... | ... | ... | | | | | | | | | | | | | |
| " 2... | 16 | 6½ | 7 | 240 | 258 | 8.45 | 312 | 322 | 313 | 316 | 312 | ... | 322 | 302 | 4 | | 5.15 | 8.20 | 7½ | 112.00 | 59.73 | 48.32 | 2.069 | 1.075 | Distillate very large. |
| | | | | | | | 305 | 302 | 304 | 304 | ... | ... | | | | | | | | | | | | | |
| " 4... | 17 | 7 | 7 | 236 | 258 | 8.35 | 313 | 316 | 313 | 312 | 310 | 312 | 316 | 302 | 5 | | 5.15 | 8.30 | 7½ | 107.58 | 57.51 | 46.00 | 2.173 | 1.075 | " " " |
| | | | | | | | 302 | 304 | 306 | 302 | 304 | ... | | | | | | | | | | | | | |
| " 4... | 18 | 6½ | 7 | 244 | 256 | 8.40 | 318 | 317 | 315 | 317 | ... | ... | 318 | 303 | 3 | | 3.30 | 6.55 | 6½ | 124 44 | 66.37 | 53.69 | 1.862 | 1.075 | Distillation stopped on account of frothing. |
| | | | | | | | 305 | 306 | 303 | ... | ... | ... | | | | | | | | | | | | | |
| " 7... | 19 | 7 | 7.10 | 230 | 270 | 8.35 | 313 | 318 | 314 | 314 | 316 | ... | 316 | 303 | 4 | | 6 | 9.20 | 8½ | 94.55 | 50.42 | 40.79 | 2.451 | 1.075 | Distillation proceeded properly. |
| | | | | | | | 304 | 303 | 303 | 304 | ... | ... | | | | | | | | | | | | | |
| " 7... | 20 | 6½ | 7.10 | 240 | 262 | 8.30 | 325 | 316 | ... | ... | ... | ... | 325 | 304 | 1 | | 1.30 | 5.35 | 7½ | 115.68 | 61.698 | 49.99 | 2.000 | 1.075 | Distillation stopped on account of frothing. |
| | | | | | | | 304 | ... | ... | ... | ... | ... | | | | | | | | | | | | | |
| " 9... | 21 | 7 | 7 | 240 | 268 | 8.30 | 318 | 313 | 314 | 310 | 314 | ... | 318 | 305 | 4 | | 5.45 | 9.10 | 6½ | 115.68 | 61.698 | 49.99 | 2.000 | 1.075 | Distillation proceeded properly. |
| | | | | | | | 305 | 305 | 305 | 305 | ... | ... | | | | | | | | | | | | | |
| " 9... | 22 | 7 | 7 | 240 | 268 | 8.30 | 318 | 316 | 316 | 314 | 310 | ... | 318 | 305 | 4 | | 6 | 9.20 | 7½ | 115.68 | 61.698 | 49.99 | 2.000 | 1.075 | " " " |
| | | | | | | | 305 | 305 | 305 | 305 | 304 | ... | | | | | | | | | | | | | |

*Observations on Oleum Æthereum*—(Continued.)

*Observations on Oleum Æthereum*—(Continued.)

| DATE. | Nurses. | Charge. | Fire Started. | Boiling (bubbles). | Boiling (active). | Reached 300° F. | First Heat. | Second Heat. | Third Heat. | Fourth Heat. | Fifth Heat. | Sixth Heat. | Highest Point attained. | Lowest point after rising to 300° | No. of rebustings. | Boiled over. | Heating discontinued & temp. at 300°. | Number of hours distilled. | Yield. | Amount of 80 to 1 oz. of Ol. Æthereum. | Amt. of Alcohol to 1 oz. sr., Ol. Æth. (mist.) | Amt. of Alcohol to 1 oz. sr., Ol. Æth. (weight). | Percent. of Ol. of the weight of alcohol used. | Specific gravity of Ol. Ætherem. | REMARKS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1864. | | c. g. | A M. | ° F. | ° F. | A M | °F. | °F. | °F. | °F. | °F. | °F | ° F. | ° F. | | P.M. | P.M. | | oz | oz. | fld. oz. | oz. | | 60° F. | |
| November 9 | 22 | 6½ | 7 | 247 | 270 | 8.40 | 315 | 318 | 309 | 312 | ... | ... | 318 | 232 | 3 | | 5·20 | 8.40 | 6½ | 120.00 | 64.00 | 51.77 | 1.931 | 1.075 | Frothed very high. |
| " 11 | 23 | 7 | 7 | 246 | 258 | 8.35 | 304 | 282 | 302 | ... | ... | ... | | | | | | | | | | | | | |
| | | | | | | | 306 | 314 | 316 | 319 | 314 | 310 | | | | | | | | | | | | | |
| | | | | | | | 305 | 306 | 305 | 305 | 305 | 302 | 319 | 302 | 6 | | 6 | 9.25 | 7½ | 112.00 | 59.73 | 48.32 | 2.069 | 1.080 | Seventh heat 308°. Frothed slightly. |
| " 11 | 24 | 6½ | 7 | 250 | 270 | 8.20 | 319 | 312 | 311 | 312 | 308 | 306 | | | | | | | | | | | | | |
| | | | | | | | 303 | 301 | 303 | 303 | 302 | ... | 319 | 301 | 5 | | 6 | 9.40 | 8 | 97.50 | 52.00 | 42.06 | 2.353 | 1.080 | Frothed slightly toward 6 P.M. |
| " 14 | 25 | 7 | 7 | 236 | 258 | 9.25 | 310 | 320 | 314 | 318 | ... | ... | | | | | | | | | | | | | |
| | | | | | | | 303 | 302 | 303 | ... | ... | ... | 320 | 302 | 3 | | 6 | 8.35 | 7½ | 108.38 | 57.806 | 46.76 | 2.138 | 1.075 | Distillation proceeded properly. |
| " 14 | 26 | 6½ | 7 | 236 | 258 | 8.45 | 313 | 317 | 319 | 315 | ... | ... | | | | | | | | | | | | | |
| | | | | | | | 305 | 303 | 302 | ... | ... | ... | 319 | 302 | 3 | | 2.50 | 6.05 | 7 | 111.428 | 59.428 | 48.077 | 2.079 | 1.075 | Frothed very much. |
| " 16 | 27 | 7 | 7 | 238 | 268 | 8.4 | 310 | 314 | 312 | 310 | 318 | ... | | | | | | | | | | | | | |
| | | | | | | | 305 | 304 | 302 | 302 | ... | ... | 318 | 302 | 4 | | 6 | 9.15 | 8½ | 93.823 | 52.638 | 42.63 | 2.345 | 1.075 | Distillation proceeded properly. |
| " 16 | 28 | 6½ | 7 | 238 | 258 | 8.35 | 316 | 317 | 311 | 313 | 315 | ... | | | | | | | | | | | | | |
| | | | | | | | 305 | 304 | 305 | 303 | ... | ... | 317 | 303 | 4 | | 6 | 9.25 | 8½ | 91.764 | 48.941 | 39.59 | 2.526 | 1.075 | " " " |
| " 18 | 29 | 7 | 7 | 240 | 270 | 8.55 | 307 | 314 | 316 | 320 | 314 | ... | | | | | | | | | | | | | |
| | | | | | | | 304 | 302 | 302 | 300 | ... | ... | 320 | 300 | 4 | | 6 | 9.05 | 8 | 105.00 | 56.00 | 45.30 | 2.207 | 1.075 | " " " |
| " 18 | 30 | 6½ | 7 | 241 | 253 | 8.30 | 315 | 315 | 314 | 319 | ... | ... | | | | | | | | | | | | | |
| | | | | | | | 304 | 301 | 312 | ... | ... | ... | 319 | 302 | 3 | | 4 | 7.30 | 7½ | 104.00 | 55.46 | 44.86 | 2.228 | 1.075 | Frothed very high. |
| " 21 | 31 | 7 | 7.30 | 235 | 260 | 9.15 | 316 | 317 | 320 | ... | ... | ... | | | | | | | | | | | | | |
| | | | | | | | 304 | 300 | ... | ... | ... | ... | 320 | 300 | 2 | | 6 | 8.45 | 6½ | 124.44 | 66.37 | 53.69 | 1.862 | 1.075 | Retort cracked; troublesome. |
| " 21 | 32 | 6½ | 7.30 | 238 | 258 | 9.30 | 317 | 314 | 312 | 316 | 315 | ... | | | | | | | | | | | | | |
| | | | | | | | 306 | 302 | 302 | 30 | ... | ... | 317 | 302 | 4 | | 6 | 8.30 | 7½ | 107.58 | 57.51 | 46.00 | 2.173 | 1.075 | Distillation proceeded properly. |
| " 23 | 33 | 7 | 7 | 218 | 270 | 8.30 | 329 | 321 | ... | ... | ... | ... | | | | | | | | | | | | | |
| | | | | | | | 300 | .. | ... | ... | ... | ... | 321 | 300 | 1 | | 1.15 | 4.45 | 5½ | 146.08 | 77.913 | 63.031 | 1.586 | 1.085 | Retort being cracked, frothed and troublesome. |
| " 23 | 34 | 6½ | 7 | 245 | 267 | 8.30 | 321 | 321 | 320 | 315 | 312 | ... | | | | | | | | | | | | | |
| | | | | | | | 302 | 302 | 302 | 303 | ... | ... | 221 | 30? | 4 | | 6 | 9.30 | 7½ | 100.64 | 53.677 | 43.424 | 2.302 | 1.085 | Distillation proceeded properly. |
| " 25 | 35 | 6½ | 7 | 240 | 270 | 8.35 | 316 | 315 | 312 | 311 | 314 | 312 | | | | | | | | | | | | | |
| | | | | | | | 304 | 304 | 304 | 301 | 304 | ... | 316 | 304 | 5 | | 6 | 9.25 | 7½ | 104.00 | 55.46 | 44.86 | 2.228 | 1.085 | " " " |
| " 28 | 36 | 6½ | 7.45 | 238 | 258 | 9.30 | 316 | 316 | ... | ... | ... | ... | | | | | | | | | | | | | |
| | | | | | | | 304 | ... | ... | ... | ... | ... | 316 | 30? | 1 | | 3 | 5 | 6½ | 120.00 | 64.00 | 51.77 | 1.931 | 1.085 | Frothed very much. |
| " 29 | 37 | 6½ | 7.30 | 238 | 260 | 9.20 | 316 | 317 | 313 | 310 | 311 | ... | | | | | | | | | | | | | |
| | | | | | | | 302 | 304 | 301 | 300 | ... | ... | 317 | 300 | 4 | | 6 | 8.40 | 8½ | 94.55 | 50.42 | 40.79 | 2.451 | 1.080 | Distillation proceeded properly. |
| " 30 | 38 | 6½ | 7.45 | 238 | 260 | 9.55 | 308 | 316 | 316 | 316 | ... | ... | | | | | | | | | | | | | |
| | | | | | | | 305 | 304 | 304 | ... | ... | ... | 316 | 304 | 3 | | 6 | 8.05 | 7 | 111.428 | 59.428 | 48.077 | 2.079 | 1.080 | " " " |
| December 1 | 39 | 6½ | 7.45 | 235 | 260 | 9.30 | 312 | 314 | 318 | 316 | ... | ... | | | | | | | | | | | | | |
| | | | | | | | 306 | 300 | 304 | .. | ... | ... | 318 | 300 | 3 | | 6 | 8.30 | 7½ | 100.64 | 53.677 | 43.424 | 2.312 | 1.085 | " " " |
| " 2 | 40 | 6½ | 7.45 | 238 | 258 | 9.30 | 320 | 316 | 310 | 314 | ... | ... | | | | | | | | | | | | | |
| | | | | | | | 304 | 301 | 304 | ... | ... | ... | 320 | 301 | 3 | | 6 | 8.30 | 6½ | 115.55 | 61.629 | 49.85 | 2.005 | 1.085 | " " " |
| " 3 | 41 | 6½ | 7.45 | 234 | 264 | 9.50 | 326 | 321 | ... | ... | ... | ... | | | | | | | | | | | | | |
| | | | | | | | 303 | .. | ... | ... | ... | ... | 326 | 303 | 1 | 1.30 | 1.30 | 3.40 | 6½ | 115.55 | 61.629 | 49.85 | 2.005 | 1.085 | Temperatures too high. |
| " 5 | 42 | 6½ | 8 | 238 | 256 | 9.50 | 324 | 315 | 316 | 312 | 316 | ... | | | | | | | | | | | | | |
| | | | | | | | 300 | 302 | 302 | 302 | ... | ... | 321 | 300 | 4 | | 6 | 8.10 | 5½ | 141.81 | 75.63 | 61.18 | 1.632 | 1.085 | Distillation proceeded properly. |

In 25 days, forty-two distillations were made, and 2055 lbs. sulphuric acid and 137 gallons of strong alcohol used. The yield was 288 oz. of heavy oil of wine; the specific gravity was taken with a hydrometer, but no correction was made for the difference in temperature, of which no record was kept. The above quantity of alcohol weighs 932·7 lbs., and one ounce of heavy oil of wine was therefore produced from 114·16 oz. sulphuric acid and 51·82 oz. avoirdupois of alcohol, which makes very nearly 2 per cent. of the latter.

The table appended to Mr. Diehl's paper may now be extended as follows:

| | Dr. E. R. Squibb. | C. Lewis Diehl, Jr., at U. S. A. Laboratory. | |
|---|---|---|---|
| | | 1st series. | 2d series. |
| Sulphuric acid required to make one avoird. oz of oil of wine, | 173 av. oz. | 157 av. oz. | 114·16 av. oz. |
| Alcohol required for the same, | 111 " | 71·77 " | 51·82 " |
| Average yield from each distillation, | 4·54 " | 5·52 " | 6·86 " |

If we examine the temperatures in Mr. Diehl's table, it will be observed that large yields were always obtained where the temperature was steadily kept between about 302 and 315° F. His largest yields were Nos. 18, 28, and 37, furnishing one oz. of oil of wine for 49 to 50½ fluidounces of alcohol. With five re-heatings, the temperature was steadily between 302 and 315, rising in the first instance, towards the close, to 316, and in both the other cases attaining the temperature of 317 at the beginning of the process.

The second best yields, requiring 52 to 53 fluidounces of alcohol for one ounce of oil, were Nos. 24 and 27. In the former the temperature rose at first to 319, but was subsequently kept between 301 and 312; No. 27 was kept between 302 and 314, rising only towards the close to 318°.

On the other hand, it will be observed, that where he obtained small yields, the temperature either rose considerably and frequently above 315, or fell below 302. Thus, of the distillations yielding one ounce of oil of wine for 75 and 78 fluidounces of alcohol, the temperature rose in No. 42 to 324, and in No. 33 to 321°. In No. 22, yielding one ounce of oil from 64 fluidounces of alcohol, the temperature fell to 282°; in Nos. 2 and 9, it fell to 298°, and the yield was one ounce from 66 to 67 fluidounces of alcohol. The only case in which

a large yield was obtained at a high temperature is No. 8, which reached 324 and 325°, and subsequently ran over; from 56 fluidounces of alcohol one ounce was obtained.

Heavy oil of wine is decomposed into the so-called light oil of wine and sulphovinic acid, if it is left in contact with cold water for some time; the decomposition is rapid and complete if warm water, or a solution of an alkali, or the carbonate of an alkali, is used. It is evident, therefore, that in order to insure the least possible loss, the washing of the crude oil with cold water must be effected in as short a time as possible.

It has been stated by Dr. Squibb and by Mr. Diehl that the formation of a crust of thiomelanic acid on the surface of the liquid in the retort, is favorable for the production of oil of wine. This may, perhaps, be accounted for by an increase of the pressure within the liquid, whereby the oil is more easily carried over with the gaseous sulphurous acid. If this crust is broken and the liquid stirred, the extrication of gases occurs so rapidly that foaming almost always takes place. Still it may be possible that the yield of oil might be increased by preventing the formation of the crust alluded to altogether, because the vapors of the oil might thereby be more readily diffused through the gases and vapors with which it distils over. Necessarily the charge for the same retorts would then have to be lessened to give room for the frothing which inevitably takes place. Another question is, whether, even if the yield was thereby increased to a certain extent, it would pay so well as with a comparatively smaller yield from a heavier charge in the same time.

Mr. Diehl is entitled to great credit for his careful observations, for his suggestions of the mode of re-heating to keep the temperature in this troublesome process within certain limits, and for by far the best results as yet obtained.

*Philadelphia, February*, 1865.

---

## NOTE ON CARAMANIA GUM.

BY WILLIAM PROCTER, JR.

Whilst engaged in the revision of the U. S. Dispensatory, Dr. Wood was presented by Mr. Benjamin R. Smith, of Philadel-

phia, with a sample of gum from a large invoice under the name of "Caramania Gum." No account of its origin could be given by Mr. Smith; but there can be little doubt that it is the same gum described by Mr. S. H. Maltass (Pharm. Journ., vol. xv. p. 20), as one of the gums used habitually to adulterate tragacanth. Mr. Maltass states that this gum is employed, to the extent of 50 per cent., to adulterate the commoner varieties of tragacanth; and to render the cheat less perceptible, is sometimes whitened by the addition of white lead. Mr. Hanbury (ibid. p. 21), in a note, states that the Caramania gum appears identical with the "*Gomme pseudo-adragante*" of M. Guibourt, regarded by that author as the product of *Astragalus gumifer*, Labill; but it is referred by report, says M. Maltass, to the wild almond, a plum of Caramania.

The "Caramania gum" occurs in pieces, varying in size from a pea to a large chestnut, with a greater tendency to the spherical than tragacanth, though sometimes with a tendency to the contorted vermicular form, so common in tragacanth. Its color varies from light to reddish-brown, more or less translucent, nearly tasteless, and slowly absorbing moisture when placed in water, swelling up to bulky hydrated, jelly-like masses; whilst the intermediate spaces are filled with a mucilaginous solution of the more soluble part of the gum, but the soluble portion is evidently less abundant than in tragacanth. The mucilage is precipitated by subacetate of lead, but less decidedly than is arabin; oxalate of ammonia causes a white precipitate, not very abundant; alcohol does not instantaneously precipitate it in flakes like arabin, apparently because of a greater resistance of the mucilage to be penetrated by that liquid. It is not coagulated by borax, or sesqui-chloride of iron. The gelatinous insoluble part has but little cohesive power at first, but by standing, it softens and becomes more paste-like. When boiled with dilute sulphuric acid, it loses its jelly form and assumes a syrupy condition, being converted partially into soluble gum and partially into glucose, as indicated by Trommer's test. A solution of oxide of copper in potassa instantly precipitates both this and the soluble gum as a bulky bluish hydrate. Dr. Wood considers Caramania gum to have the same origin as the gum of Bassora, and that probably both are produced in the Province of Caramania, in Asia Minor—the

latter entering commerce by the Persian Gulf, whilst the former comes to Smyrna, to be used as an adulterating agent.

---

## THE PHARMACEUTICAL DEPARTMENT OF A U. S. A. HOSPITAL.

By Edward R. Fell, M. D.

The Pharmaceutical Department of "Mower" U. S. Army General Hospital, Chestnut Hill, within the City limits of Philadelphia, is situated on a corridor which bisects the ground inclosed by the wards of the hospital, which are arranged in the form of a quadrilateral with rounded corners.

This provides ready access to different portions of the building. It consists of three apartments; one of which is styled the "Dispensing" room, another the "Store" room, and a third a small out-house, in which are manufactured those preparations requiring heat, and those that would otherwise, by vapors, dust, etc., incommode the occupants of the store room.

The first of these is 68 × 14 feet, of which a small portion is partitioned off as an office and sleeping apartment for the hospital Steward in charge. The counter is 60 feet long by 3 feet wide, and is placed opposite three good sized windows; one half of its width is devoted to its legitimate use, and the other to a series of wooden compartments, which are adapted to contain forty-seven tin trays, one for each ward. Into these trays the prescriptions, dressings, etc., ordered by the Surgeons are placed: they are then carried to their respective wards by the "Ward Masters," and replaced, after the articles are distributed.

Four pairs of scales are kept on the counter; two for prescriptions, and two for weighing amounts of the gravity of four or five pounds.

The shelves, back of the counter, are divisioned off into twelve equal portions, in which the medicines are, to a great extent, similar. Thus each prescriptionist may fill his prescriptions without moving from his place. By this provision, all confusion is avoided, and time saved.

Each division contains eight quart salt-mouth bottles, containing substances usually prescribed in considerable amount; twenty-

four quart "tinctures," for the various Ethers, Syrups, Fluid Extracts, Tinctures, and Waters, in most common use; twelve six-ounce covered jars, for Pills, Ointments, and Solid Extracts; thirty-four ounce salt-mouth bottles, for Quinine, Morphia, Salts of Mercury, Powdered Rhubarb, etc. The lower shelf, wider than those above, surmounts three rows of drawers, which, however, have proved of but little use, all the drugs being kept in glass-stoppered bottles. On this shelf is kept a pair of small scales and weights, and sufficient room is afforded for the use of the utensils required in compounding prescriptions.

In one end of this apartment is a capacious sink, furnished with hot and cold water, over which are to be found Glass Funnels, Mortars, Graduates, and a large number of empty vials, from half to eight ounce, cleaned and ready for use. In another end of the room is a small closet in which are kept the mineral acids, Atropia, Strychnia, Bromine, etc.

When the hospital is full, its capacity is 3600; the force employed in the "Dispensary" is twelve. They are intelligent pharmaceutists, and are employed by contract. To each one is apportioned four wards. He fills the orders from these wards, and is required to have his division cleaned and put in working order twice daily. He keeps a note of the bottles that need replenishing, and at an appointed time fills them from the supplies on hand in the "Store-room." An accurate account of articles thus furnished is kept, so as to make the amounts on hand tally with those furnished. Night calls are answered by the Steward.

From 500 to 800 new prescriptions are put up here monthly, and during the year that I have been on duty here, no serious mistake has occurred; on the contrary, not a few errors in prescriptions are detected and returned for correction. The compounding is accurate and neat, and reflects considerable credit on those engaged in this responsible business.

Prescriptions are written by the Physicians on printed blanks, on which, in four places, around the margin, in large type, is printed the number of the ward; this, together with the fact that the name, and bed-number of the patient prescribed for, is written in an apportioned place, renders it scarcely possible for a prescription to get to any but the proper person. Empty bottles,

pill boxes, etc. being placed outside of the door of each ward, are returned to the dispensary by means of a small car, which, running on a track around the hospital, at the same time, supplies the various stimulants to the wards. Every article, whether medicine or dressing, furnished to the wards from this department, requires an order written on a prescription blank, as an accurate account of such articles as Syringes, Air Cushions, Medicine Glasses, etc., is kept with each ward. An inventory of what is kept in the ward, is furnished weekly to the dispensary by the Surgeon in charge of the ward. Articles returned are accompanied by a receipt which secures the proper credit.

Books for reference are kept in the Steward's office, and consist of the "U. S. Dispensatory," "Fowne's Chemistry," "Parrish's Pharmacy," and the "Pharmacopœia," which latter, however, is not on the Supply Table.

Communicating with the Dispensary is the "Store-room." This is 30 by 29 feet. About one-fourth of it is boarded up and kept under lock and key. Here is stored Wine, Brandy, Whisky, Porter, etc., and some of the more valuable Drugs; among the latter, I noticed, 200 oz. of Sulph. Quinine, 200 pounds Patent Lint, Sulph. Morphia, Ether, Chloroform, fine Sponge, Iodide of Potassium, Citric Acid, etc., in large amount.

Two sides of the "Store-room" are devoted to stout shelves, on which large quantities of Tinctures, Fluid Extracts, Syrups, Waters, various Salts, "made up" Pills, Powders, etc., are kept. Liquid preparations are contained, for the most part, in tin cans and bottles. Ointments, and Cerates, those used largely, are kept in large stone jars.

Another wall of this room is provided with large "pigeon holes," which contain Bandages, Trusses, Castile Soap, Isinglass, and Adhesive Plaster; under these, shallow drawers contain various spread Plasters; for most of the latter, paper is used, sheepskin being too expensive. Usually four persons are employed in this room. Each has his prescribed duty to perform; one attending to the liquor orders, another to the manufacture of the preparations, and so on.

All sorts of medical appliances may be found here, and in fact

most of the articles obtained by requisition for a three months supply for 3600 beds.

There is a display of neatness and order in this department, which commends itself to the most particular.

Opening a back door, you are under a shed which affords protection for the railroad cars, of which I have spoken. A few yards further and you come to the "Laboratory," 14 by 16 feet, built of stone. The apex of the roof is closed by a sky-light, which provides for the exit of troublesome smoke and fumes. Here may be found a large-sized cooking stove, and some of the more ordinary apparatus used in the manufacture of pharmaceutical preparations.

Almost all of the officinal Tinctures are prepared here, in quantities ranging from 10 gallons, to ½-gallon. Most of these are made by maceration, as percolators, except Glass Funnels, are not furnished.

Many of the Fluid Extracts, and a few Solid Extracts, are made here, but the proper means for the nice regulation of the heat used in evaporating is not available; those that I have had occasion to use, however, have proved efficient in the ordinary doses. Among the preparations made here may be mentioned: the principal Emplastra, Pill Ferri. Carb., Hydrarg. Biniodid., and Protiodid. Hydrarg c. Cretæ, Potassii Sulphuret., and most of the Syrups, Cerates, Ointments, Wines, and Waters of the Pharmacopœia.

Medical supplies are obtained on requisitions, signed by the Surgeon in charge of the hospital, and "approved" by the "Medical Director," from the "Medical Purveyor." Most of them come from the U. S. A. Laboratory located in this city; others bear the labels of our widely-known manufacturers. Printed "Supply Tables" enumerating all the articles furnished by the Government, are provided, together with the "allowance" for a certain number of beds, for a certain time. The amount on hand must be stated, as well as the amount required. In connection with this, the following Table may prove interesting:

| | Quantity allowed by supply table for 9 months. | Am't used over allowance in 9 months. | Excess of allowance for nine months. | Amount expended in nine months. |
|---|---|---|---|---|
| Acaciæ Pulv., | 130½ lbs. | | 36½ lbs. | 94 lbs. |
| Acid Acetic, | 40½ " | | 13½ " | 27 " |
| " Citric, | 67½ " | | 29½ " | 38 " |
| " Muriatic, | 22½ " | | 8½ " | 14 " |
| " Nitric, | 31½ " | | 14½ " | 17 " |
| " Sulphuric, | 22½ " | 8½ lbs. | | 31 " |
| " Phosphoric, | 4 " | | 2 9-16ths lb | 1 7-16ths lb |
| " Tannic, | 12 3-8ths lb | | 6½ lbs. | 6 1-8th lb |
| " Tartaric, | 130½ lbs. | | 93½ " | 37 lbs. |
| Aloes Pulv., | 7 7-8ths lb | | 5¼ " | 1⅝ " |
| Ammon. Spts. Arom., | 20¼ lbs. | | 6¾ " | 13¼ " |
| Ant. et Pot. Tart., | 3 3-8ths lb | | 7-8ths lb | 2⅛ " |
| Argent. Nit. Fus.&Cr., | 12 3-8ths lb | | 3¾ lbs. | 8⅝ " |
| Cerat. Adipis, | 648 lbs. | | 268 " | 380 " |
| " Canth., | 90 " | | 60 " | 30 " |
| Cinchoniæ Sulph., | 84 3-8ths lb | | 76⅜ " | 8 " |
| Chloroformum, | 117 lbs. | 106 " | | 223 " |
| Creta Prep., | 40½ " | 29¾ " | | 70¼ " |
| Ether Sulphuric, | 261 " | | 191 " | 70 " |
| " Nitrosi, Spts., | 216 " | | 64 " | 152 " |
| Ext. Fld. Aconit. Rad., | 40½ " | | 18½ " | 22 " |
| " " Cinchonæ. | 67½ " | 12½ " | | 80 " |
| " " Colch. Sem., | 24 11-16ths. | | 13⅜ " | 11 5-16ths lb |
| " " Valerianæ, | 40½ lbs. | | 13½ " | 27 lbs. |
| " Solid, Conii, | 5 " | | 2⅜ " | 2⅜ " |
| " " Belladon., | 5 " | | 2 9-16ths lb | 2 7-16ths lb |
| Hydrarg. C. Mit., | 27 " | | 15½ lbs. | 11¼ lbs. |
| " Pilulæ, | 13½ " | | 10½ " | 3 " |
| " Unguent., | 72 " | | 48 " | 24 " |
| Bals. Copaib., | 153 " | | 64 " | 89 " |
| Tinct. Ferri Chlor., | 67½ " | 37½ " | | 104⅜ " |
| Syr. Ferri Iodid., | 36 " | 2 3-8ths lb | | 38⅜ " |
| Liq. Ferri Persul., | 20¼ " | 3 3-16ths lb | | 23 7-16ths lb |
| Pulv. Ipecac. et Opii, | 40½ " | | 27 " | 13½ lbs. |
| Farina Lini., | 58½ " | 115⅝ lbs. | | 174¼ " |
| Morphiæ Sulph., | 20½ oz. | 6¾ oz. | | 27 oz. |
| Ol. Morrhuæ, | 124 galls. | | 71 galls. | 53 galls. |
| " Ricini, | 99 " | | 66 " | 33 " |
| Tinct. Opii, | 8½ " | 24½ galls. | | 33 " |
| " " Cam., | 8½ " | 17 " | | 25½ " |
| Pil. Cath. Comp., | 700 pills. | 12888 pills. | | 20588 pills. |
| Potassii Iodid., | 99 lbs. | | 19 lbs. | 80 lbs. |
| Quiniæ Sulph., | 62 " | | 33 " | 29 " |
| Strychnia, | 4½ oz. | | 3 oz. | 1½ oz. |
| Liq. Sodæ Chlorin., | 270 lbs. | 640 lbs. | | 910 lbs. |
| Emp. Adhesiv. spread, | 495 yards. | 2665 yds. | | 3160 yds. |
| Lint, Patent sheet, | 216 lbs. | 832 lbs. | | 1048 lbs. |
| " Picked, | 162 " | 572 " | | 734 " |
| Oiled Silk, | 162 yards. | 108 yds. | | 270 yds. |
| Oiled Muslin, | 162 " | 405 " | | 567 " |
| Fine Sponge, | 20 lbs. | 12 lbs. | | 32 lbs. |

*Not on Supply Table, and furnished by special requisition.*

| | |
|---|---|
| Bromine | 13 lbs. |
| Lupuline | ½ " |
| Powd. Rad. Jalap | 1½ " |
| Ext. Fld. Sarsap | 33 " |
| Potass. Permang | 12½ " |
| Potassii Bromid | 2 oz. |
| Gum Ammoniac | 1½ lbs. |
| Pix Abietis | 10 " |

and many others.

From this it will be perceived that, in most instances, the allowance is in great excess, falling short mostly in the way of "Dressings," Chloroform, the simple and camphorated Tincture of Opium, and Sulphate of Morphia. Chloroform is used here, almost entirely, in preference to Ether.

Where the allowance falls short, special requisitions are made on the Purveyor. Almost any additional medicines may be obtained in this way. Some of those obtained are mentioned in the table I have furnished.

It will be seen that the reputation of our Government, for the care of its soldiers, is well sustained in the matter of medical supplies.

A yearly report of all medical and hospital property received, expended, issued, and remaining, must be furnished to the Medical Department at Washington, and every article that has been supplied must be satisfactorily accounted for. Broken articles are "condemned" at the time of the visit of the "Inspector," and those destroyed require a voucher, properly signed.

As regards the Pharmaceutical, as well as in the other departments of this Hospital, the greatest economy, consistent with the comfort of the patients, is practiced; and few "leaks" escape the vigilance of the Surgeon in charge and his executive officer.

I cannot close this article without acknowledging the courtesy, in regard to these details, of Steward Pierson and his assistants.

*Philadelphia, Feb.* 8, 1865.

## ON PURE CARBONIC ACID, MINERAL AND LITHIA WATER.

By Prof. Henry Wurtz.

I am desirous of directing the attention of pharmaceutists, through the pages of the American Journal of Pharmacy, to a subject whose more careful consideration would, I believe, result in great advantages to the public as well as themselves. I allude to the provision and production by them, of purer, more wholesome, more palatable and more reliable forms of carbonic acid water and artificial mineral waters. It has now become so universal a practice on the part of the public to resort for such preparations to the counter of the pharmaceutist, that it behooves every earnest man of this class to follow up closely the march of discovery and improvement in this important branch of his art, and to place himself, in this respect, on a level above that of the mere bar-keeper or the vender of ginger pop.

Notwithstanding the great attention given by eminent transatlantic chemists and medical men, to the artificial fabrication of the waters of natural healing springs, it is not to be denied that few of our American chemists have accomplished much in this field; and as to our physicians, it may be asserted that they also have generally treated it with neglect. This undervaluation of the matter may be clearly shown to be, to use mild terms, improper and inconsiderate. Without, however, entering upon the discussion of this extensive topic at length, we may give here a paragraph relating to "Seltzer water," from a little work recently published by Carl Schultz, a young chemist of New York, who has devoted himself for a number of years to the study of the practical manufacture, on a large scale, of pure mineral waters, a paragraph which will be eminently suggestive, to every intelligent man, of the truly *vital* importance of the subject.

"The great effectiveness of certain Spas should not, therefore, be ascribed to one or two of their prominent constituents, but to the very harmony which their composition presents with the mineral ingredients of the human blood. Let us take *Selters*, for example, and compare its composition with that of the ashes of blood serum, according to an analysis which is considered as the most reliable one (by Lehmann:)

| | Blood serum. | Selters. |
|---|---|---|
| Chloride of Sodium . . . | 17·292 grains. | 17·2920 |
| Chloride of Potassium . . . | 1·150 | 0·3580 |
| Carbonate of Soda . . . | 8·180 | 6·1533 |
| Phosphate of Soda . . . | 0·900 | 0·0042 |
| Sulphate of Potash . . . | 0·780 | 0·3970 |

The resemblance would be still more striking, should we compare all mineral ingredients of the *blood* with those of Selters; and that Spa has, on that account, always seemed to us, of all natural mineral water, the most philosophically compounded. It is not a whim that has made of Selters a luxury; it is not an accident that it agrees with people, that it is always liked, and that they never get tired of its use. We explain it by the composition of the Spa; it furnishes the normal mineral ingredients of the blood in a condition in which they are easily absorbed, independently of the state of digestion; it must have a tendency to establish them in their normal fixed proportion, and to induce a healthy metamorphosis of matter by reflex action. It is also apparent why other Spas of more marked variations can be advantageously used for the restoration of a normal condition of the blood, in cases where its composition has undergone more serious changes; and why carbonic acid water, by dissolving the mineral ingredients of food, will gradually produce the same result. The single consideration that blood contains its own volume of carbonic acid gas in solution, shows the importance of using water of the same condition. The production of carbonic acid is largest in a healthy state of the system, and is always diminished in chronic diseases, and in most conditions which interfere with perfect health; and as that gas must form an important constituent of the gastric juice and intestinal liquids, we find such disorders usually accompanied by impaired digestion, and the use of carbonated waters signalized by improved nutrition."

For much further matter of moment I must refer to the original*, which is in fact a compendium that should be read by every medical man and pharmaceutist.

The practical artificial reproduction of such a mineral water, (which, in view of the analogy pointed out by Mr. Schultz, we may call, almost without hyperbole, the natural milk of our mother earth presented to us fresh from her bosom,) all chemists know to be a matter of far less simplicity than is usually imagined. The preparation, on a large scale, in a reliable state of purity, and homogeneous combination of the ingredients, belong to the most difficult

*Schultz & Warkers' Mineral Spring Waters, etc., by Carl Schultz. Published by Westermann & Co., New York, 1865.

and delicate class of manipulations. Space will here allow only more particular allusion to the difficulties encountered in the preparation and purification of one of the most essential ingredients, the *carbonic acid*. The materials generally used are *oil of vitriol* and *ground limestone*. Contaminations, derived both mechanically and chemically from both of these, are almost invariably imparted to the gas.

Mechanically (in the form of infinitesimal spray) may be carried over sulphates of lime, magnesia and iron, with the sulphuric acid itself, and *lead* and sometimes *arsenic* contained therein; while chemically there may pass over sulphurous acid (from the oil of vitriol,) sulphuretted hydrogen (from pyrites and other metallic sulphurets in the limestone,) and frequently, also, the limestone evolves, under the action of the acid, bituminous and nitrogenous organic vapors of nauseous odors and savors. What wonder that the opinion should be prevalent, even among those accustomed to natural carbonic acid waters, that plain "Soda Water," as found in the shops, must necessarily be a nauseous dose, only made palatable by disguising it with syrups, essences, etc.

Let no captious Rip van Winkle, adherent to the hermetical lore of our grandsires, aver that these minute impurities are therapeutically nugatory. Such a one, to be consistent, must repudiate such waters altogether, both natural and artificial, for—without going to the same absurd extreme as Hahnemann's disciples—we cannot, at the present day, deny that the frequent repetition of minute, though still chemically appreciable, doses of powerful medicaments, will usually produce in time a greater or less cumulative effect.

Even if these initial difficulties have been conquered, as they usually *are not*, the storage and preservation in quantity of carbonic acid water presents a new class of obstacles. Reservoirs for the purpose must have the difficultly compatible qualifications of infrangibility, both by pressure and percussion, cheapness and total resistance to the solvent power of the acid liquid. No *metal* combines these, except possibly tin of *chemical purity* (an article not of commercial attainment at present, as the best Banca tin is contaminated with copper, zinc, lead and arsenic.) Common

glass is too frangible, and has not sufficient resisting power if vessels of large capacity are required, and malleable glass is still among the "lost (?) arts." Still, it would appear that this universal material has been made available for the purpose, as the glass reservoir or soda water fountain here figured (patented by Schultz & Warker) is an apparatus already in use.* The outer cylinder is of metal, the inner only, which contains the liquid, of glass. There is a gas communication and consequently equality of pressure between the interior and exterior of the glass vessel, so that the latter has nothing to sustain, but the weight of itself and contents. The fitness of the arrangement is at once apparent. The small portable glass fountains, which are operated by a thumb press, are becoming well known.

The most interesting chapter in Mr. Schultz's treatise is that upon artificial *lithia waters*, which he has been the first to introduce into our American Materia Medica. This chapter, after discussion of the successive discoveries of Arfvedson, Bunsen, Lixowitz, A. Ure, Garrod, Ruef and others, gives the results of some original researches by Mr. S. himself; the whole forming an array of facts relating to the power of lithia waters, to remove morbid secretions of uric acid and urates, which must convince any candid mind that we now possess a powerful specific antagonist to one of the most cruel enemies ever loosed from Pandora's box to scourge our race for its "pleasant vices."

I shall close with a condensed review of some of the more important facts presented by Mr. S., most of which will be new to a large class of readers. The name *lithia*, given by its discoverer, Arfvedson, in 1818, because supposed then to be exclu-

* These fountains, I am told, are now being manufactured in New York.

sively a mineral alkali, and found only in *stones*, was found by Bunsen, a few years since, by spectrum analysis, to be a misnomer, lithia existing also in grain, grapes, milk, blood, etc. Lixowitz first discovered the great affinity of lithia for uric acid, and that the urates of lithia were by far the most soluble of all urates. Alex. Ure experimented on a human calculus containing uric acid with carbonate of lithia at 98°, and finding it actively dissolved, proposed injections of lithia solutions into the bladder in cases of calculus. Garrod, in 1857, found that when water was boiled with an excess of carbonate of lithia, addition of uric acid dissolved the whole with formation of soluble biurate. He also acted upon a metacarpal bone, the phalangeal extremity of which was completely infiltrated with a gouty deposit of urate of soda, with a few grains of carbonate of lithia, which dissolved the whole deposit in three days. In 48 hours a cartilage, infiltrated with urate deposit, was similarly restored to its normal condition. G., therefore, recommended carbonate of lithia in *uric acid diathesis with gravel and in chronic gout.* He found that one to four grains, two or three times a day, caused gravel to diminish, and even to cease. At that early day enough lithia was not attainable, even for experimental purposes, so that additional conclusions had to be deduced from observations on natural lithia waters. Ruef reports that the *murguelle* of *Baden-Baden*, containing 2·37 grains of chloride of lithium in 16 ounces, which has recently been found suitable for patients suffering from gout and lithiasis, in almost all cases causes *an increased pain in the joints at first*, in bad cases amounting to torture, but that a rapid cure follows, cases of not too long standing yielding in three or four weeks. The practice was in some cases to put in additional quantities of carbonate of lithia, and *then to impregnate the water with carbonic acid.*

Mr. S. remarks that our knowledge of the reactions and even of the solubilities of uric acid and the urates are very incomplete, these solubilities, as given in the text books, "having been mostly determined for hot and cold solutions, while physiologically it is of the highest importance to have them made at the temperature of the blood." One part of carbonate of lithia and one part of uric acid dissolves in 90 parts of water at the ordinary tempera-

ture, but at boiling heat one part of carbonate of lithia dissolves almost four of uric acid. In following up the above experiment of Garrod, Mr. S. found that the simultaneous solution of carbonate of lithia and uric acid was accompanied by *no effervescence*, bicarbonate of lithia being formed. On adding more uric acid gradually, at the point when the whole of the lithia becomes either urate or bicarbonate, effervescence commences, and until this effervescence ceases the uric acid continues to dissolve. Mr. S. concludes that "the urate of lithia is more soluble than the carbonate, and less soluble than the bicarbonate." After the effervescence and taking up of the uric acid ceases, a little water added will clear up the solution, and enable it to take up still more uric acid. He finds that a mixture of chloride of lithium and carbonate of soda has the same solvent power as the carbonate of lithia, accounting for the medicinal action of natural waters containing the lithium as chloride, this being necessarily decomposed in the blood by the alkalies thereof. He gives the formulæ of his "Lithia Water" and "Vichy with Lithia," which are prepared with great care, and have proved highly successful in a number of cases.

Schultz points out that while it cannot be expected that lithia water can remove calculi which consists of phosphates and oxalates instead of urates, yet that Wöhler and Frerichs have shown*, by experiments on man and dog, that the administration of urates causes the excretion of *large quantities of oxalate of lime in the urine*. Referring to the discoveries of Wiederhold, that uric acid is excreted by the lungs and *skin*, as well as the kidneys, he asks whether the absence of diaphoresis, often observed in gouty persons, may not be connected with an accumulation of uric acid. Also, that the fact stated by Lehmann, that in all *fevers* the proportion of uric acid in the urine always increases, suggests an important extension of the usefulness of lithia waters. The symptoms observed as following the use of Schultz & Warker's lithia waters agree closely with those described by Ruef above, namely, an increased pain in the affected parts at first, and a subsequent amelioration of the disease. This pain furnishes a valuable index of the progress of the cure.

* Ann. der Chem. und Pharm., 65, p. 385.

The production of lithia, Mr. S. believes, will soon become equal to the demand. Among the recently discovered sources, he cites the hot springs of Wheal Clifford, whose waters contain enough lithium (2·85 grains of chloride in 16 ounces) to amount in 24 hours to over 700 pounds of chloride of lithium discharged therewith. The present price of pure carbonate of lithia in this country, we are told, is not less than *eight dollars per ounce*.

*New York, February* 10, 1865.

---

## BERNARD S. PROCTOR'S REPORT ON WEIGHTS AND MEASURES.

In the November number of this Journal, (vol. xii. p. 495) a very brief and imperfect abstract was given of a "Report on weights and measures used in Pharmacy," read by Mr. Bernard S. Proctor, at the Bath meeting of the British Pharmaceutical conference, September, 1864. It was again referred to in the January number, (vol. xiii. p. 74.) The importance of the subject, and the ability of the writer shown in its discussion, appear to justify a more deliberate notice of this interesting paper. Mr. Proctor, after remarking that "about forty different pounds, and almost as many different ounces" are found in use through Europe,—comments on the circumstance that "*Pharmaceutical* weights do not take such multiple proportions; some two or three systems being pretty widely used, and, on the other hand, the discrepancies between the different systems are often not so great," and that even where the decimal metrology has been established by law, or adopted by general consent for scientific and commercial purposes, "the long-used systems have retained their hold upon the medical profession;" indicating the strong feeling in favor of uniformity in *medical* weights, and against changes, liable to doubt, difficulty and danger. The writer then asks the vital question: "What objections are there to the use of the English apothecaries' weights for pharmaceutical purposes?"

He replies to this question, that "in the abstract there is little to be said against it;" and that though the relation which its divisions bear to one another is "a sort of hap-hazard affair," these are yet found to be "all convenient units for practical use."

The pound, the ounce, and the drachm, are each divisible into halves and quarters, and the pound and drachm, into thirds and sixths.

"The objections are almost all external to the system itself; they arise out of its relation to other systems, from which in practice, it cannot be abstracted; and this fact let us keep in view as a caution against systems which appear promising when seen only upon paper. However good they may be in the abstract, availeth not, for they must be judged by their readiness to fit into other systems, to fill their own place well, and work harmoniously with all collateral institutions. It is in these points that the shortcomings of our present system are found. While we buy and sell by one weight, and dispense by another, both of which have units bearing the same names, but of different values; while we have ounces of water, which, though used for dispensing purposes, correspond to the commercial weights, and drachms of water which do not agree with either the apothecaries' or avoirdupois drachm; while a pound of water may be prescribed, but who can tell what it means; for it is frequently dispensed as ℥ xvi., sometimes as ℥ xii., and neither of these is an apothecaries' pound; while we have grains in England which are heavier than grains in Ireland or Germany, and lighter than grains in Austria, and while we require to make a separate calculation for every quantity mentioned in a French formula, before we can prepare it, or even compare it with a formula expressed in English weights,—there certainly are inconveniences in the present arrangement which it is desirable to remove. But even the very statement of these inconveniences shows that no change in our system can remove them. If we move toward the Irish, we will be further from the Austrian and no nearer the French. If we adopt the metrical weights, unless they be used for all purposes, we will find a greater disparity between our dispensing and our dealing than exists at present. No wonder that all the changes which have been proposed have been rejected; they were all partial evils, not universal good."

Various projects of reform are then referred to—As that of Mr. Jacob Bell, to engraft the troy divisions on the avoirdupois pound of 16 ounces, either employing the present grain as the standard, (increasing thereby the larger weights,) or taking the present avoirdupois ounce as the standard; (reducing the weight of the grain:—that of Mr. Griffin, who proposed to employ a unit of 7 grains, multiplying it in a decimal scale, (thereby preserving the avoirdupois pound:—that of Dr. C. Wilson, taking the avoirdupois ounce as the standard, and giving it the divisions of the present troy ounce, (thus reducing the drachms, scruples

and grains about one eleventh.) This is the system which was *provisionally* adopted by the British colleges in their recent revision of the Pharmacopœia, but which was finally abandoned.

In regard to this disturbance of the value of the grain, Mr. Proctor well remarks:

"At present we have in Britian, one grain, about which there is no mistake; while all other weights are subject to equivocal interpretation. The scruple is 20 grains in England and 18 in Ireland; the drachm [troy or avoirdupois,] is 60 grains, or 27 grains in England, or 54 in Ireland; so the ounce is 480 or 437 grains; the pound 7000 or 5760 grains. We cling to the grain, reluctant to lose our last unequivocal weight."

These attempts at amalgamating the troy and avoirdupois weights, while they show the natural desire to retain, if possible, the best parts of either system, show also the difficulty of accomplishing this end.

"So the two systems are pitted against one another; compromise is found impracticable, the contest is a struggle for existence, a war of extermination, which must end in the annihilation of one or both of the competitors."

Mr. Proctor, after suggesting still another modification of these ill-assorted rivals, based upon the Irish system, (increasing our present grain about one eightieth) thus adverts to the report on weights and measures published in the Proceedings of the *American* Pharmaceutical Association for the year 1859.

"The proposition of the American Pharmaceutical Association, unquestionably the most carefully considered, the most elaborate, and most ambitious of the proposed plans, is based on the belief, and I think I may say the well-grounded belief, that for all practical purposes, counting by eights has the greatest sum of advantages. It is founded, like the metrical system, on geometrical measurement, a sextant of the equator being 8 times divided by 8, to give their module or radical measure of length (15⅜ inches); the cube of this measure gives the root of the table of capacities, under the name of modius. The weight of a modius of water gives the pondus, or root of their system of weights.

This octonary system cannot be regarded as a proposal for the reformation of the weights used in pharmacy; but for revolutionizing the whole system of metrology. It does not harmonize with any other system, and its advantages would be materially reduced if it met with only partial adoption.

The compilers of the British Pharmacopœia have shown their skill in evading a difficulty which they could not overcome. They were bound to use such weights in the work as would not be liable to be misunderstood;

they have therefore adopted avoirdupois ounces and pounds, which are in general use both in Great Britian and Ireland, and troy grains, which are also now used in both islands. Drachms and scruples, which have a different value on the two sides of the Irish Sea, are not used in their formulæ nor acknowledged in their table, and their disuse is recommended. But this recommendation is not likely to be followed; drachms and scruples will still be used, and will have different values in the sister isles, so the difficulties will continue until a more potent remedy is discovered."

Having thus referred to several of the proposed schemes of amendment, Mr. Proctor judiciously observes that the comparative merits of these varying projects, can only be considered with reference to the circumstances under which they are to be adopted, or the conditions intended to be fulfilled. And he contemplates the subject under these several points of view.

"First, supposing that we have to reform pharmaceutical weights without changing any other system now in use. Secondly, supposing we have to arrange a system of weights and measures for general adoption in Great Britain. Thirdly, supposing we have to contrive or select a system most complete in itself, and consequently most deserving of universal adoption, without reference to any systems at present existing."

"Under the circumstances first supposed, we have to provide a system convenient in itself, harmonizing, as nearly as may be, with troy or avoirdupois weights, especially the latter, bringing into coincidence our weights and measure of capacity, and involving in the change as little trouble and risk, with as little ambiguity as possible. These requirements appear to be most nearly met in the propositions of Mr. Bell, Dr. Wilson, the Irish system, and the modification of the Irish system, which has been pointed out above."

The writer is disposed to regard this last as involving the least inconvenience, and as being "the most advantageous change which the pharmaceutical body could make in their weights and measures."

"Secondly, supposing we have to select a system which shall be used for all purposes throughout Great Britian, there is *not the same necessity* that it should harmonize with the troy and avoirdupois weights, though a simple relation between some prominent weight in each is desirable as a means of converting quantity of one scale into quantity of the other. *There is more need* that it should harmonize with the weights and measures of other countries; there is the same necessity that weights and measures should correspond with one another; also in this case the harmony with our arithmetic, and the abstract convenience of the system must have a larger share of our attention. The ultimate decision of the

question depending upon the comparative importance we attach to these several considerations."

And in this connection the writer comments on the decimal scales of weight and measure proposed by Mr. Griffin, and by Mr. Warrington, and on the whole gives the preference to the French metrical system.

"The octonary system of the American Pharmaceutical Association, the only one which can be said to compete with the metrical in regard to completeness and uniformity of arrangement, is also the only one which can compete with it as a plan for universal and permanent adoption. The existence of this rivalry is my strongest inducement for delaying the recommendation of any great change till the merits of octavial, decimal, and it may be also of duodecimal systems have been fully canvassed, and for recommending that the reform of British metrology should, for the present, be limited to such changes as could without great difficulty, be made in the existing weights and measures, and would render them harmonious and unequivocal. It is on this ground that the modification of the Irish system, which I before suggested for the reform of pharmaceutical weights, I would now recommend for general national adoption—not as an institution to be unchangeable in future ages, but as a simple alteration which could free us from all the great evils of our present want of system, and enable us at a future time, to adopt any better arrangement with greater facility than at present.

Turning to the third case supposed—that is, that we have to contrive or select the best system possible, without reference to existing customs, which may give a temporary and unreal advantage to those which are made to suit present circumstances. The systems to which I shall draw attention, as suited for this purpose, are the metric-decimal and the American octavial.

The advantages of a décimal system are simply that it brings the tables of weights and measures into accordance with our modes of expressing number, every *place* giving a value to the number which occupies it; so that if several numbers are placed together, each has, in virtue of its position, ten times the value of that to the right-hand of it, and one-tenth of the value of that at the left; and these positional values are multiplied by the value of the digit which occupies the place.

Looking to pharmaceutical practices for evidence regarding the comparative utility of decimal or octavial scales, we find a general preference for the latter. Concentrated infusions and decoctions are made, so that one part equals eight of the normal strength. The great majority of bottles used for dispensing, etc., are founded upon octavial numbers of ounces. 1, 2, 4, 6, 8, 12, and 16 are the current sizes. 20 ounces are not frequently used, 10 ounces still more rarely, and five ounces quite unknown. Looking at the posological table in 36 cases

taken at random, [comparing the minimum dose with the maximum] . . . . there are 21 instances in which the octavial scale would most readily meet the wants of the case; 15 in which duodecimal would have the advantage; but no instance in favor of the decimal,—no doubt, because the decimal scale does not so readily express these simple relationships.

Taking at random 22 prescriptions, I found the relation between the separate ingredients, and the total quantity to be of an octavial nature in 32 cases, to be of a duodecimal nature in 10 cases, and of a decimal character in only 1. I found the total quantity, estimated as a multiple of the smallest ingredient, was 13 times octavial, 6 times duodecimal, and only one decimal. I found the number of doses ordered was 9 times octavial, 6 times duodecimal, and only 1 decimal.

The division of paper into pages for a book is almost necessarily done by binary or ternary folding; we have folio, quarto, octavo, etc., and duodecimo, but no division by tens.

The mariner's compass is necessarily divided by fours and powers of fours.

Many other instances might be adduced in which the natural process is evidently doubling and halving repeatedly performed; but I do not know of any instance in which division or multiplication by 5 or 10, is by the force of natural circumstance a matter of necessity. This repeated halving, a matter of necessity in some cases, a matter of convenience in others, has become a matter of habit in almost all. To adapt our weights and measures to this fact, is to adapt ourselves to our circumstances, and work in harmony with natural laws. To establish a system which does not afford facilities for this natural process is to work in ignorance of natural laws, if not in direct opposition to them; and nothing established upon such a foundation can be eminently convenient, or permanently successful.

Having now discussed the relative merits of octavial and duodecimal division; and having in my former paper pointed out what I considered the principal failings of the metrical system, I have now only to point out those particulars in which I think the American octonary scale may be advantageously modified.

There is no great advantage in deriving a system from a natural standard; and if the standard weights or measures are to be repeatedly derived from the so-called natural source, they will be liable to variation, either from the 'natural source' itself varying, as in the case of the foot; or our estimate varying, as in the case of the metre, the pendulum, or the cubic inch of water."

Granting the full force of what the writer then proceeds to urge—to wit, that a "standard of weight defined by a certain piece of metal or other durable substance," (as adopted by the

Commissioners appointed by the British Government to report upon standards,) will always have an accuracy of ascertainment far within that of the best determination of a cubic measure of water,—we still think that this "certain piece of metal," selected for the standard, should not be arbitrarily assumed; but should always be brought into unison with a "natural" standard with all the accuracy attainable. To say nothing of the advantage of a very closely approximative restoration of a *lost* standard,—thereby rendered possible,—the practical conveniences of precise geographical factors, and of simple and direct relations between lengths, weights, and measures of capacity, are certainly too obvious and too great to be lightly thrown away. Thus where we are furnished with a bushel, the root of whose cube is precisely the measuring rule in common use, (one of the many advantages which result from an octonary scale of weights and measures) the benefit is by no means a trivial one that the farmer can always without any calculation make himself a cubical box, (whether to supply, or to verify a measure,) whose capacity shall be fully as accurate as the "bushel" he may purchase,—even admitting that such a process may not have the precision that would satisfy the experimental philosopher. And this is a benefit which would attach equally to every unit of measurement in the scale. Whenever so radical a change is contemplated as the introduction of new divisions or denominations of measure, the importance of adopting at the same time the most useful or convenient standards that can be devised, is too eminent to justify a moment's hesitation in throwing aside every thing that has not some *intrinsic* value to plead for its preservation.

"If we accept the modified avoirdupois weight as a transition scale, the pound would naturally become our root, both of weight and capacity; and the inch or foot would be a suitable root for lineal measure, which would have the advantage of preserving a convenient relationship, and mode of converting the old quantities into the new notation, and would enable us to continue the use of established rules for converting bulk of various materials into weight.

The report of the American Pharmaceutical Association speaks approvingly of the practice of calling new weights by old names. I must express my disapprobation of such a practice. I think one of the weak points of their scheme is the calling 34 ounces a pound, 44 ounces an

ounce, and ½ ounce a drachm; their proposed pint is 41 ounces, and their gallon 16½ imperial pints."

That there are very serious inconveniences attendant upon the employment of equivocal terms, or of denominations having different values, cannot be denied. It is one of the penalties of an erroneous system, that in the transition to a better one, there is danger of confounding the "old style" with the new. The adoption of the reformed Gregorian calendar is a notable illustration of this. It would perhaps be much better and safer, if reformed standards, could always be established with their own appropriate and distinctive nomenclature; but all experience has shown that this is just the part most difficult of a popular establishment. The continued inconvenience therefore of having a new-style "pound" and an old-style pound merely as the transitional confusion in leaving a bad system for a good one, appears to us to be by no means so great as that we are now enduring in the actual co-existence of two incongruous "pounds."

Mr. Proctor concludes his interesting report with the suggestion that an octonary scale of weights and measures would be very simple even in the presence of a decimal arithmetic; and that it would perhaps furnish the easiest introduction to a general numeration by eights.

"On the adoption of the octavial weights, measures, and money, the figures 8 and 9 would fall into comparative disuse; the former being expressed as "1" of the higher order, thus, 1 0; and the latter as one of the higher order *plus* one, thus, 1 1; this would be the first step towards octavial numeration, if it was found desirable."

T.

---

## PRACTICAL OBSERVATIONS ON THE MANUFACTURE OF OLEUM ÆTHEREUM.

By C. Lewis Diehl, Jr.

During the manufacture of *Oleum Æthereum*, the operator frequently meets with difficulties which are in a great measure inexplicable. With a view to alleviating these to some extent, the writer offers this paper as the result of his experience, and hopes that it may lead to further investigation by more experienced operators.

On commencing the manufacture of Oleum Æthereum, the writer had no practical experience to guide him, and, of course, had to rely on the observations and experience of others for information. Among others, the papers of Dr. E. R. Squibb, Journal of Pharmacy, vol. v. 3d series, p. 194, and Proceedings Am. Pharm. Association, 1860, were found to give the most explicit information on the subject, and served as a guide for the comparison of results.

At the U. S. Army Laboratory, Philadelphia, the manufacture is carried on in glass retorts of the best French make, and of a capacity of seven to eight gallons. They are heated by means of a sand bath fifteen and a half to sixteen inches in diameter and twelve inches deep; the depth of the sand under the retorts is never more than half an inch, and does not come up on the sides of the retort more than about five inches. This facilitates the cooling of the retort in case it is desirable. The mixture introduced into the retort consists of equal measures of 95 per cent. alcohol, and sulphuric acid, sp. gr. 1·845, care being taken to allow all the sulphate of lead to separate before introducing the mixture. The charge for a retort of seven gallons capacity is six and a half gallons; the refrigeration is effected by means of a large Liebig's condenser, and the distillate is collected in a tubulated receiver, which is so arranged that the distillate will enter through the tubulure, and the incondensible gases will pass through a tube, connected with the large end of the receiver, into the chimney. The joints are made air-tight by means of cork and India-rubber tubing. The sand baths can be heated in a very short space of time, the furnace being of an excellent construction, and the flues of which make a complete circle around the sand bath before entering the chimney, with an excellent draft. It is necessary to give a detailed description of the apparatus employed to permit of a thorough appreciation of the difficulties experienced at the laboratory.

At the suggestion of Prof. J. M. Maisch, of this laboratory, an accurate account of the temperatures at which the distillation proceeded from hour to hour, during the day, was kept

for some time, with a view of ascertaining at what temperature the yield of heavy oil of wine was most abundant, and also to decide whether the troublesome frothing could be regulated, and how far it was influenced by the temperature.

The following table is compiled from a series of observations as to temperature, collected during a period of three months, and represents a fair average of results:*

| Number. | Amount of mixture used. | Temperature at 9 o'clock. | Temperature at 10 o'clock. | Temperature at 11 o'clock. | Temperature at 12 o'clock. | Temperature at 1 o'clock. | Temperature at 2 o'clock. | Temperature at 3 o'clock. | Temperature at 4 o'clock. | Yield. |
|---|---|---|---|---|---|---|---|---|---|---|
| | Galls. | ° F. | ° F. | ° F. | ° F. | ° F. | ° F. | ° F. | ° F. | oz. |
| 1 | 6½ | 287 | 290 | *307 | 298 | 284 | 289 | *304 | 276 | 5½ |
| 2 | 6½ | 160 | 261 | *303 | *307 | *313 | 297 | 282 | ..... | 5½ |
| 3 | 6½ | 178 | *307 | *306 | *306 | *302 | 297 | *306 | 298 | 5½ |
| 4 | 6½ | 174 | 298 | *307 | *306 | *307 | 291 | *316 | *304 | 4½ |
| 5 | 6½ | 190 | 289 | *313 | ..... | ..... | ..... | ..... | ..... | 4½ |
| 6 | 6½ | 164 | ..... | 299 | *310 | *306 | ..... | ..... | ..... | 4½ |
| 7 | 6½ | 198 | *310 | *305 | *314 | 293 | *306 | 294 | 275 | 4½ |
| 8 | 6½ | 116 | 276 | 298 | *300 | *304 | 296 | *309 | 293 | 4½ |
| 9 | 6½ | 150 | 230 | 289 | *301 | 292 | 288 | *300 | 296 | 3½ |
| 10 | 6½ | 148 | 237 | 288 | *302 | 293 | 298 | 293 | *306 | 3½ |
| 11 | 6½ | 156 | 295 | *308 | *303 | 296 | *307 | *303 | 290 | 3½ |
| 12 | 6½ | 108 | 276 | *302 | 298 | *300 | 299 | 290 | 294 | 3½ |
| 13 | 6½ | 128 | *300 | 296 | 287 | 288 | 207 | 251 | ..... | 2½ |

In case of No. 5, the liquid frothed and boiled over between 11 and 11 o'clock. In that of No. 6, it boiled over between 1 and 2 o'clock.

It will be observed from the above table, that the results were very variable; yet they indicated that the quicker the temperature is brought to 300° F., and the longer it is kept above that point, the larger will be the yield. Nos. 3, 2 and 4 will fully explain the advantage of heating quickly and keeping up the temperature, while the numbers from 9 to 13 will show the disadvantage of a low temperature. Number 1 is the only instance that came to notice in which a low temperature gave a good yield.

As regards the frothing, no very satisfactory conclusions

* In this and the following table all temperatures of 300 and above are marked *.

could be arrived at from merely watching the temperature. In the cases of Nos. 5 and 6, the temperatures had been brought to 310° and above at the first heating. It was therefore thought necessary to prevent the heat from rising above 305° at the first heating. But, from results since obtained, it was observed that the temperature could frequently be raised to 315° and over, without frothing. For this reason the frothing was chiefly attributed to other causes, in conjunction with the temperature, and it was concluded, that where temperature alone could be held accountable for the frothing, it was generally above 320°. The presence of sulphate of lead may be mentioned as one of the principal cases of frothing, and this has been already observed and fully appreciated by Dr. Squibb, (see Journ. of Pharm., vol. v. 3d series, p. 197). Other circumstances, however, appear to effect the same results. During the latter part of the distillation, copious quantities of a black matter (thiomelanic acid) are formed, which when the distillation has proceeded properly, forms a thick crust on the top of the liquid in the retort. A portion of this will frequently coat the walls of the retort, and is, in most instances, readily removed with a sponge and water or alcohol. Sometimes, however, it will adhere pertinaciously to the bottom, and can only be removed with great difficulty. When this is allowed to remain, it will almost invariably cause frothing, and, in many cases, boiling over. This can be avoided by cleaning the retort with sand and a little ether. It is generally recommended to allow the mixture of alcohol and sulphuric acid to stand twenty-four hours before using it, for the purpose of getting rid of the sulphate of lead. In the writer's experience, this time is not long enough when large quantities are used, from two to three days being necessary.

The following table has been collected from observations made since the first series of distillations, and may merit some attention:

| Number. | Amount of mixture used. | Fire lighted. | Reached the temperature of 300°. | Highest temp. observed. | Lowest temp. observed. | Temp. at six o'clock P.M. | No. of times reheated. | Boiled over at | No. of hours distilled. | Yield. |
|---|---|---|---|---|---|---|---|---|---|---|
| | Galls. | | | ° F. | ° F. | ° F. | | | | oz. |
| 1 | 6½ | 8 A.M. | 10.15 A.M. | *315 | ..... | ..... | 1 | 11.40 A.M. | 3.40 | 4½ |
| 2 | 6½ | 8 " | 11.30 " | *318 | ..... | ..... | 2 | ..... | 10 | 6 |
| 3 | 6½ | 8 " | 10.20 " | *318 | 290 | 280 | 2 | ..... | 10 | 6½ |
| 4 | 6½ | 8 " | 10.40 " | *314 | 290 | *315 | 3 | ..... | 10 | 6½ |
| 5 | 6½ | 8 " | 9.45 " | *322 | ..... | ..... | 1 | 4 P.M. | 8 | 4½ |
| 6 | 6½ | 8 " | 10.35 " | *322 | ..... | 250 | 2 | ..... | 10 | 6 |
| 7 | 6½ | 8 " | 11.50 " | *318 | ..... | 298 | 1 | ..... | 10 | 5 |
| 8 | 6½ | 8 " | 10.10 " | *326 | ..... | 294 | 2 | ..... | 10 | 6½ |
| 9 | 6½ | 8 " | 10.35 " | *336 | ..... | ..... | 2 | ..... | 16 | 5½ |
| 10 | 6½ | 8.30 " | 9.55 " | *312 | ..... | 298 | 2 | ..... | 9.30 | 5½ |
| 11 | 6½ | 8.30 " | 10.10 " | *316 | ..... | 290 | 1 | ..... | 9.30 | 5 |
| 12 | 6½ | 7.30 " | 9 " | *316 | ..... | ..... | 2 | 3.50 P.M. | 8.20 | 5½ |
| 13 | 6½ | 7.30 " | 9.30 " | *314 | ..... | ..... | 1 | ..... | 10.30 | 5½ |
| 14 | 6½ | 8 " | 9.40 " | *318 | ..... | 290 | 3 | ..... | 10 | 7½ |
| 15 | 6½ | 8 " | 9.50 " | *316 | ..... | *310 | 3 | ..... | 10 | 6½ |
| 16 | 6½ | 8 " | 9.30 " | *320 | ..... | *302 | 2 | ..... | 10 | 6 |
| 17 | 6½ | 8.15 " | 10.5 " | *316 | ..... | *300 | 2 | ..... | 9.45 | 4½ |
| 18 | 6½ | 8 " | 10.5 " | *320 | 290 | *305 | 2 | ..... | 10 | 6½ |
| 19 | 6½ | 8 " | 10 " | *322 | 294 | ..... | 1 | 2.20 P.M. | 6.20 | 5 |
| 20 | 6½ | 8 " | 10.25 " | *322 | 290 | 284 | 2 | ..... | 10 | 6 |
| 21 | 6½ | 9 " | 11.30 " | *322 | ..... | ..... | 2 | ..... | 9 | 5½ |
| 22 | 6½ | 11.30 " | 1.45 P.M. | *328 | *300 | *310 | 2 | ..... | 9 | 7 |
| 23 | 6½ | 12 M. | 2 " | *311 | *300 | *302 | 2 | ..... | 9 | 7 |
| 24 | 6½ | 11.30 A.M. | 1.20 " | *312 | *300 | ..... | 3 | 8 P.M. | 8.30 | 7 |
| 25 | 6½ | 11 " | 2 " | *318 | ..... | ..... | 2 | ..... | 10 | 7½ |
| 26 | 6½ | 1.30 P.M. | 3.30 " | *317 | ..... | ..... | 2 | ..... | 10.30 | 5½ |
| 27 | 6½ | 8 A.M. | 10.20 A.M. | *314 | 290 | *315 | 2 | ..... | 10 | 6 |
| 28 | 6½ | 8 " | 10.20 " | *322 | 294 | ..... | 2 | 2.30 P.M. | 6.30 | 6 |
| 29 | 6½ | 8 " | 10.10 " | *320 | *300 | *310 | 2 | ..... | 10 | 6½ |
| 30 | 6½ | 11.30 " | 1.25 P.M. | *312 | *300 | ..... | 2 | ..... | 10 | 6½ |

It is to be regretted that the table could not be kept more fully, but during the rush of business at the time this was impossible. Sufficient, however, has been collected in it to justify the conclusions that have been drawn. The chief points of interest in the table are—

1. The time at which the temperature reached 300°;
2. The highest temperature attained;
3. The lowest point the temperature fell to after it had reached 300°;
4. The number of heatings it was subjected to;

5. The temperature at 6 o'clock, P. M..
6. The yield.

The management of the fires in the foregoing operations was such that the temperatures would rise rapidly to about 295°, the draft door was then closed until 300° to 305° were reached, when the fires were dampened by means of ashes. The temperature would then generally rise from 310° to 315°. As soon as the temperature had fallen again to between 300° and 305°, heat was again applied until it began to rise, when the fires were again dampened; the temperature would then again rise and reach sometimes as high as 320°. The management of the heat requires great care and constant attention, for, if the fire is kept strong until the temperature reaches 310°, the liquid in the retort is very apt to froth over. In managing the fires, the operator should be able to raise the heat or withdraw it at very short notice. To this end it is best to work without the dampers; all that is necessary when the fire is to be dampened, will be to close the draft door, open the fire door, and cover the live coal with coal if the fire is moderate, or with ashes if it be very strong. The advantage of keeping the damper open will be obvious here, for a cold draft will enter at the fire door and cause more rapid cooling. The fire can be raised again at short notice by opening the draft door and closing the fire door.

The formation of a crust on the top of the liquid in the retort is considered favorable to the distillation, as it appears to prevent the frothing up almost entirely. In one case (No. 9, table 2) the temperature had attained 336° without causing frothing over, while in other cases where the crust had become accidentally broken and the temperature was much lower, the liquid frothed over like a flash, scarcely leaving time to save the distillate. In all cases, except the last-mentioned, the frothing takes place slowly, affording ample time to make the proper disconnections. The froth was generally allowed to rise within one-half inch of the neck before the connections were loosened, and the retort was not entirely disconnected until it began to enter the neck. It was observed that if the

bubbles thrown up during the earlier period of the distillation were very small, the liquid was very apt to froth; if, on the contrary, the bubbles were large, this seldom happened, and, in fact, in the only cases where it did so, the cause could be traced to high heating. It is well, therefore, to watch the retorts very closely, and to manage the fires carefully when the boiling takes place in small bubbles. The temperature should, however, in no case be allowed to fall below 300°, even if it is at the risk of frothing, for very good yields have been obtained where frothing occurred.

The distillate obtained generally consisted of two layers; the heavier containing water saturated with sulphurous acid, the lighter consisting of an ethereal solution of oil of wine. Occasionally, however, the positions were reversed, the solution of oil of wine taking the lower stratum, while the watery liquid occupied the upper; and several instances have occurred when three layers were formed, the upper and lower consisting of solution of oil of wine, while the centre was occupied by the watery liquid. The oil of wine was separated from its solution by exposure to a dry current of air for from twelve to twenty-four hours. The liquid was then found to have separated again into two layers, and was mixed with about three times its volume of distilled water, transferred to a separatory funnel and allowed to remain at rest for several hours. The oil was then drawn off and the process of washing repeated until it no longer affected litmus.

Oil of wine, as thus obtained, is a limpid, oily liquid, of a pale straw color, having a pungent and aromatic taste, and an odor reminding of the artificial fruit essences. No very accurate examinations as to specific gravity were made. In three cases noted, they were respectively 1·065, 1·095, 1·100, and, as far as recollected in a number of other cases, they ranged between 1·080 and 1·100.

On the basis of the foregoing observations, it may be convenient to state, in a more condensed form, the precautions necessary in the distillation of heavy oil of wine.

"The retort should be set in a sand bath with but a thin

layer of sand under it, and but a few inches up its sides, which facilitates its rapid cooling when desired.

"The fires should be managed without the damper; all that is necessary being to close the draft door, open the fire door, and cover the fire with coal or ashes, according to circumstances.

"The presence of sulphate of lead in the mixture, or of thiomelanic acid on the sides of the retort, has a tendency to cause frothing, and should be avoided.

"The temperature should be raised rapidly to 300° or 305° F., after which the fire is immediately to be dampened. If the fire has been very strong, it should not be raised above 300°; if only moderate, it may be raised to 305°. The temperature will then generally rise spontaneously to from 310° to 315°.

"The temperature should be kept above 300° as long as possible, and this may be done by re-heating as often as it falls to near 300°. As soon as the temperature begins to rise again, the fire must be dampened; for, if the heating be continued until the temperature reaches 310°, it is very apt to rise above 320° and cause frothing. It should always be avoided to raise the temperature above 320°, as the yield of oil of wine is not increased by raising it above that point, and it is more apt to cause frothing.

"If the liquid froths, the first step must be to pull the fire out of the furnace and then fan the retort vigorously, which frequently prevents frothing over."

In conclusion, it may not be uninteresting to give an account of the results of three months' distillation, from March 17th to June 17th.

The total amount of sulphuric acid used was 5485 lbs.; of alcohol, sp. gr. ·809, it was 367¾ galls. This yield was 558⅛ oz. avoirdupois, making one ounce of heavy oil of wine to every 70 ounces by weight of alcohol and 157 ounces of sulphuric acid used. The number of days on which distillation was carried on is fifty-four, during which time one hundred and two distillations were made. Of these, fifteen frothed over, out of which three distillations were lost, leaving ninety-nine distilla-

tions from which yields were obtained, and making the average yield from each retort 5·52 avoirdupois ounces.

From an article by Dr. E. R. Squibb, Proceed. Am. Pharm. Association, 1860, the following yield is taken to compare the yield at the U. S. A. Laboratory,—viz.:

The amount of sulphuric acid used was 1664 lbs.; the amount of alcohol was 100½ galls. = 668 lbs. The yield was 87 fluidounces, which, calculating the sp. gr. of the oil at 1·1, is about 96 avoirdupois ounces. The number of distillations was twenty-one, making an average for each distillation of 4·14 fluidounces, or 4·54 avoirdupois ounces. To make one avoirdupois ounce it required 111 ounces of alcohol and 173 ounces sulphuric acid sp. gr. 1·854.

The following table will plainly show the difference of results:

| | Dr. E. R. Squibb. | U.S.A. Laboratory. |
|---|---|---|
| Amount of sulph. acid required to make one avoir. ounce of oil of wine | 173 Avoir. ounces. | 157 Avoir. ounces. |
| Amount of alcohol required for the same | 111 " " | 70 " " |
| Average yield from each distillation | 4.54 " " | 5.52 " " |

*Proc. Amer. Pharm. Assoc.*, 1864.

---

## ON SOUTHERN PRICKLY ASH BARK.

By Prof. Robert Bridges.

Among the questions proposed during the session of the American Pharmaceutical Association for 1862 is the following: "What is the true botanical source of Southern Prickly Ash Bark;" which was accepted by Professor Thomas, and on the next meeting, at his request, "dropped for the present." Professor Thomas had, in the mean time, however, endeavored to obtain specimens for the purpose of investigation, but without apparent success. One of his friends, to whom he subse-

quently applied in January of this year, was enabled to obtain, at Beaufort, S. C., branches of the prickly ash, and transmit them to Philadelphia, at which place they arrived a short time after Dr. Thomas' decease. On the specimens coming, with the private cabinet of their late Professor, into the possession of the College of Pharmacy of Philadelphia, the Board of Trustees of that institution requested Professor Bridges to take charge of the specimens, and transmit an answer to question eleven of 1862, to the American Pharmaceutical Association at their next meeting in September.

The specimens were collected by Mr. W. Heyser, a graduate of the School of Pharmacy, who, in an accompanying note, says, "*Aralia spinosa*, or a plant I shall call that, is very abundant on the *Sea Islands*. *Zanthoxylum Carolinianum*, called by the negroes 'toothache bush,' is also abundant. This is, I think, *Z. tricarpum* of Elliot's old botany."

That Mr. Heyser has correctly assigned the "Southern Prickly Ash" to its true botanical source, if this name be confined to the product from the continent, and not extended to that from the West India Islands, will be evident from the following observations:—Professor Asa Gray, the standard authority for North American botany, in the "Flora of North America," separates the Northern and Southern species of Zanthoxylum into two subgenera, the latter distinguished by the name Ochroxylum, and the species Carolinianum, this being the name first applied to the plant. Lam. Dic. 1786, ii. p. 40. As synonymes he gives tricarpum, Mich. Pursh. Elliot, fraxinifolium, Walter. In "The Natural History of Carolina, Florida and the Bahama Islands, by Mark Catesby, F.R.S.," is a very graphic description of the "Zanthoxylum Spinosum," &c., at p. 26. "The Pelitory or Toothache Tree. This tree seldom grows above a foot in thickness, and about 16 feet high. The bark is white and very rough. The trunk and large limbs are, in a singular manner, thick set, with pyramidal-shaped protuberances pointing from the tree; at the end of every one of these there is a sharp thorn. These protuberances are of the same consistence with the bark of the tree, of vari-

ous sizes, the largest being as big as walnuts. The smaller branches are beset with prickles only."

The only species with which this may be confounded is the "Z. Clava-Herculis," a native of the West India Islands. Hans Sloane (Voyage to the Islands of Madeira, &c., and Jamaica, vol. ii. p. 28,) under "xxii. Evonymo affinis Arbor Spinoso," &c., describes this species as "one of the largest and tallest trees in the Island," (Jamaica.)

"It has a gray and whitish colored bark, smooth only here and there along the trunk, having long obtuse prickles like cocks' combs; the branches are forty and more feet in height, and are all beset with short crooked prickles."

James Macfadyen (The Flora of Jamaica) gives, with the exception of the size of the tree, a similar description,—"stem erect, armed with numerous, strong thick spines or prickles; branches spreading, thorny." From these accounts there are no means of distinguishing the two species in the absence of the leaves; and as these, from the branches being collected in January, did not accompany the specimen, it is necessary to seek further for distinguishing marks. In the "Histoire Naturelle des Vegetaux, par M. Edouard Spach, vol. ii. p. 365, these two species are described as follows:

"Z. Clava-Herculis. Aiguillons courts, geminees, enlargis a la base.

"Z. tricarpum, Mich. Catesby, t. 26. Branches elatées armées des nombreux aiguillons tres-pointus, fortement dilatés a la base, atteignant quelques fois une pouce de diametre."

Dr. Julius Martigny and also Mr. J. Dyson Perrins, speaking of the bark of Clava-Herculis, describe it as peculiar from its highly laminated structure, splitting up like bast. We have here then two characters in Clava-Herculis not to be found in Carolinianum, viz., "aiguillons geminees," and a bast-like structure of the bark; and if we have in addition the locality from which the bark has been derived, a correct opinion of the botanical source may be formed, there being no evidence that Clava-Herculis is a native of the continent, or Carolinianum of the islands. In relation to Clava-Herculis, Elliot expressly

states, "With this species I am entirely unacquainted. Does it not really belong to the West Indies? The Hercules club of our negroes and countrymen is, as far as I have been able to ascertain, the Aralia Spinosa."

The specimens sent by Mr. Heyser, and portions of bark (derived partly from an older tree) in the cabinet of the College, agree so well with the characters given by Catesby and Sloane, that but few additional remarks are required. The Beaufort specimens consist of branches varying from three inches to three lines in diameter. The bark adheres strongly to the wood, is thin and brittle, and the protuberances on the large branches are surmounted by the remains of the thorns. The thorns on the young branches are of a brown color, shining, very sharp, mostly straight, with a large base. On the large branches they appear weathered, having lost their color, polish and acuteness. In the bark of greater age, the spines are lost and the protuberances alone remain. These appear to be formed of successive annual layers of corky substance, gradually increasing in diameter towards the base, which is sometimes nearly diamond-shaped, the longest diameter most usually longitudinal to the branches, but occasionally transverse. In thickness the bark (College specimen) varies from that of writing paper to one-sixth of an inch. Its pungency is greater than that of the Northern prickly ash.—*Proc. Amer. Pharm. Assoc.*, 1864.

---

## IN REGARD TO THE PRESERVATION OF GARLIC.

By A. P. Sharp.

In accepting this query it was not with the expectation of making any extensive experiments in regard to the subject referred to, but more especially to propose to the Association the plan I have pursued for some years to protect the bulblets against the germination which is so fatal to the virtues of the plant as a medical agent. At the proper season I carefully select the quantity needed, and after depriving them of their superfluous leaves, stems, &c., place them in a bottle which is securely closed with either glass or cork stopper, and pour upon them a small

portion of alcohol, say about two ounces to a quart jar. The vapor of the alcohol is soon absorbed by the bulbs, and, so far as my experience goes, entirely destroys all their vitality; hence, all tendency to germinate is destroyed, and in this manner the article under consideration can be kept (as I have done) for years, and at the same time its virtues apparently maintained to the last so far as smell, taste, &c., goes to prove it.—*Proc. Amer. Pharm. Assoc.*, 1864.

---

## BITTER WINE OF IRON.

By James T. Shinn.

Preparations of bitter tonics in wine, and of iron in the same menstruum, have been in use for many generations, and various formulas for making them are to be found in old medical works. In "The Complete English Dispensatory," published in 1730, by John Quincy, M. D., quite a number are given for Vinum Ferri, Vinum Chalybeatum, Vinum Amarum, &c., but none combining the iron and bitters, though in some remarks on the medical properties of wine of steel, it is stated to be very efficacious when given with the stomachic bitters; it is also recommended to be mixed with wine of vipers, thereby increasing the effect, if not improving the taste; but this latter article is now scarcely to be found, save in some antiquated apothecary's shop window, and the human race is sufficiently tinctured with the old serpent without resorting to such an infusion.

Early in this century, Dr. Physick, of Philadelphia, prescribed a bitter wine of iron by macerating iron filings, gentian, orange peel and ginger in old cider, which, though containing but little iron in solution, was considerably used by the profession, and kept its popularity until within a few years; the tannin in the orange peel caused it to become quite dark in color, which detracted from its elegance as a preparation.

In 1841 M. Beral published some notices of various preparations of iron, including citrate of sesquioxide and of the magnetic oxide, and of one called chalybeate wine of quinquina, of which he says, "Composed of elements which were sup-

posed incompatible, this chalybeate wine constitutes a new medicine, the necessity of which is frequently seen, and which, in the hands of physicians, receives numerous useful applications. Fifty grammes of this wine contain one gramme citrate of iron, and the soluble principles of three grammes of quinquina; the quantity may be increased at pleasure."

The introduction into this city of a preparation combining the properties of cinchona and iron with wine, appears to be due to Peter J. Hassard, who, about five years ago, was requested by Dr. J. F. Meigs to make such an article; he, being familiar with the extensive use made by empirics of citrate of iron and quinine, prepared the bitter wine of iron by dissolving that salt in sherry wine, adding sugar and orange as flavor.

In the American Journal of Pharmacy for 1861, there was published a formula for "Hubbell's Bitter Wine of Iron," made with an extract of bark and citrate of the magnetic oxide of iron. ("This oxide does not form salts." Fowne.) As is remarked by Prof. Procter, only the salts of cinchona bark are contained in this preparation, and it would be equally effective and much more convenient for the apothecary to make it from the sulphates of quinia and cinchonia, which are always in his shop.

Upon inquiry among several of the leading pharmaceutists of Philadelphia, I find much difference exists as to the mode of making "Vinum Ferri Amarum." Some only sell the old article of Dr. Physick; others use ordinary extract of cinchona bark and citrate of iron, adding citric acid to prevent blackening, or treating the solution of extract with carbonate of iron, and filtering out the tannate; while many dissolve the citrate of iron and quinine in wine. This latter salt, as found in commerce, is of uncertain strength, and objectionable on that account.

The points to be considered in devising a formula for bitter wine of iron are, efficacy, agreeability of taste and appearance, economy and convenience of preparation.

The salts of the cinchonas rank highest among the tonics, and the sulphate of cinchonia is considered by many physicians

quite as effective as the sulphate of quinia: in the Philadelphia Dispensary it is used altogether as a tonic and anti-periodic with complete success; and Dr. John Conrad, of the Pennsylvania Hospital, who has had extensive experience in regard to it, thinks it equally certain, when given in rather larger doses than the quinia. This being the case, economy would point to its introduction into the preparation under consideration, while the facility of manipulation with the salts instead of ext. of bark, and the elegance of appearance in the result, are additional reasons.

The following is a recipe by which I have made the article for a long time with satisfactory results, and combines to some extent the desirable points enumerated above:

| | |
|---|---|
| Take of Sulphate of cinchona, | ʒvj. |
| " of quinia, | ʒij. |
| Citrate of iron, | ℥iv. |
| Citric acid | ℥j. |
| Sherry wine, | Oiv. |
| Alcohol, | Oj. |
| Orange syrup, | Oj. |

Dissolve the sulphates and citric acid in a pint and a half of hot water, and the citrate of iron in half a pint of the same; mix the solutions, and add the other ingredients.

This contains about half a grain of the cinchona salts and two grains citrate of iron in each teaspoonful, and is much stronger in tonic power than most of the articles made by other apothecaries, and consequently is not quite so pleasant to the taste. It must be impossible to give cinchona or its salts in sufficient doses to be effectual without a decided bitterness, or at least no soluble preparation is now known that is free from such taste. The pharmaceutist who can show the physician a capital formula, and at the same time please the patient with an agreeable and attractive-looking medicine, is the one to succeed, but the two things are often incompatible with a strict observance of said formula.

The materials above given are on the shelves of every apothecary, and may be put together in fifteen minutes, forming an

agreeable remedy of pleasing appearance and tonic power. The proportions may be varied, and sherry wine used instead of part water, as also the officinal solution of citrate of iron, being careful to heat it before mixing with the other salts; but the formula as given fulfils, as near as may be, the conditions before mentioned of efficacy, agreeability, economy and convenience of preparation.—*Proc. Amer. Pharm. Assoc.*, 1864. *Philadelphia*, 1864.

---

## GLYCERIN—ITS MISSION (SO TO SPEAK) AS A REMEDY, AS AN ADJUVANT AND AS A SOLVENT.

By W. J. M. Gordon, Cincinnati.

When I accepted this subject at the last meeting of the Association, I expected to have given it more attention than my time during the past year would permit. Not having investigated it as thoroughly as desirable, I will present what I have accomplished in connection with much that is not new, so as to present it as fully as possible, and leave it for the experiments and suggestions of all who may be interested in it.

Glycerin, it is generally known, possesses a wonderful range of solvent properties, dissolving many substances not soluble in alcohol or water. Its agreeable taste, harmless action upon the system and perfect assimilation with human digestion, specially adapt it when other substances would be rejected. Its sweetening property being almost equal to cane-sugar syrup, but differing from it in not being liable to fermentation; resembling oils, but, unlike oils, miscible with alcohol and water in any proportion; not volatile at ordinary temperatures, and not becoming hard at the freezing point of mercury. Possessing these properties, it cannot but be an article of importance both in pharmacy and in the arts.

The high price, heretofore, no doubt, has kept it from many uses to which it is now applied. Recently, glycerin, adapted to the various purposes to which it is extensively used, has been produced at a lower price than alcohol, sugar, or oil, which it has come in competition with, and which places, it

seems specially adapted to fill to a considerable extent; and the large amount and low price at which it can be produced, makes it worthy of attention at a time particularly when every article of utility should be carefully looked after.

Medicinally, glycerin has been used for its nutritive and alternative effect, and in some cases with marked success, being admissible when cod-liver oil and other unpleasant substances would be rejected. These and its soothing effect in coughs, are the principal internal uses to which it has been applied alone. Its more important medicinal value is as a vehicle for the preparation of a great variety of remedies for both internal and external use.

It is a favorite article in combination with the hypophosphites, known as glycerole of hypophosphites, and, never disagreeing with the most delicate stomach, as sugar is liable to do, is admissible when syrup is not.

Iodide of iron prepared with it in the place of syrup, makes a handsome and permanent preparation.

Its preservative and solvent property being so much greater than that of sugar syrup, cannot fail to recommend it in the place of that substance for the preparation of ipecac, senega, hive syrup and such vegetable preparations as are liable to fermentation, specimens of several I now exhibit made with glycerin, costing $2.00 per gallon, which are elegant in appearance, and will undoubtedly remain without change an indefinite length of time.

Its uses externally are numerous. For chapped skin and rough and excoriated surfaces, it has no equal; for sore nipples, skin diseases, ulcers of various kinds, to prevent excessive suppuration and cleanse the secreting surface.

It is highly recommended in deep abscesses with diseased bone, combined with iodine, which it dissolves. With many, it is a favorite mode of applying iodine and its salts.

It is used in cerates and ointments, which do not become rancid so soon when combined with it; as glycerole of lead, in place of Goulard's cerate, glycerin being used in the place of wax and oil; as glycerole of kino, which is said to be unchange

able; in the preparation of lactucarium in a liquid form, by which its activity and reliability are more certain; as glycerole of aloes, tar and arnica for external use. It is used with starch in the proportion of 1 oz. of glycerin to 70 grs. of starch for making an article called "plasma," as a substitute for lard or cerate. And it no doubt possesses advantage in preparing vegetable extracts, such as belladonna, aconite and others for external use, as they can be readily mixed with it; for liniments, in the place of oil, as it will not become rancid; and has been suggested for the extraction of the active principles of vegetable substances in place of oil and fats, to be used in the preparation of cerates or ointments.

Incorporated with vegetable extracts, it will prevent mouldiness and keep them soft, and for pill masses liable to become hard it is a good addition. It may be used as an addition to poultices to keep them soft, or any article to be kept in a moist or plastic condition.

Its solvent and preservative properties are of great importance to the pharmaceutist. In the preparation of fluid extracts, it will be found to supply the place of alcohol and sugar to much advantage. My experience is such as to convince me that in most cases extracts will be more permanent by supplying the place of alcohol used to preserve them with glycerin. To fluid extract of Jalap, Veratrum viride, Cinchona aromat. and Iris versicolor, glycerin was added and all the alcohol evaporated out, specimens of which I now exhibit, presenting a handsome appearance. Sarsaparilla and those liable to fermentation will be much better preserved with it.

I have used glycerin as a menstruum in the preparation of extracts of cloves, nutmegs and Ceylon cinnamon, and the preparations are elegant representatives of the substances from which they were made.

It dissolves the vegetable acids, most of the vegetable alkaloids, sulphuret of potassium, permanganate of potassa, sulphate of copper, zinc, iron and potassa, alkaline and some of the metallic chlorides;

Iodide of ammonium, cadmium, zinc, potassa, sodium, lime and manganese;

Freshly precipitated carbonate of iron;

Most of the metallic oxides to some extent;

Nitrate of potassa, silver, copper and lead;

Citrate of iron, citrate of iron and quinine, citrate of iron and strychnia, tartrate of iron and potassa;

Pyrophosphate of iron, and most saline substances.

Heating to give it greater fluidity will generally increase its solvent property.

It may not be amiss to name other purposes for which glycerin is largely used. Much the largest quantity used for any one purpose, except that of filling gas meters, is in the manufacture of hair oils, tonics and washes, for which it is admirably fitted, taking the place of alcohol and castor oil, which are now too expensive for the purpose, and by its undrying property keeping the hair moist in appearance.

It is largely used in tobacco, and is particularly adapted to the article known as fine-cut, preserving it in a moist state an indefinite length of time; and, unlike sugar, molasses and infusion of liquorice, which has been used for the same purpose, it will not turn sour, and is unchanged by exposure to the air.

Wine and liquor manufacturers use it to improve liquors, by giving body and removing the fiery taste.

It is used by manufacturers of woollen goods in place of oil, being more economical and not requiring soap to wash it out.

Manufacturers of cotton goods use it in size to prevent rapid drying.

Printers use it in place of molasses to make rollers, which will not dry and shrink.

It is used by artists in clay and plaster of Paris, to preserve it in a plastic form for modelling.

It is used in soaps.

For filling wet meters, used in measuring illuminating gas, it is now extensively used, and possesses decided advantage over whisky or any substance before used for the purpose. It is practically free from any objection, not evaporating at any ordinary temperature, and can be sufficiently diluted to prevent its absorption of more water from the gas, and not liable to

freeze at any degree of cold meters are subject to, and rendering them free from the attention necessary if filled with whisky or water.

It deserves attention as a lubricator for fine machinery, not congealing or being affected by exposure to the atmosphere.

Numerous other applications have been made of it, and its uses will increase as its wonderful properties become known.

---

## ON THE PURIFICATION OF ESSENTIAL OIL OF ALMONDS.

BY WILLIAM A. TILDEN,

*Demonstrator in the Laboratory of the Pharmaceutical Society.*

Among the numerous processes that have been suggested for the purification of essential oil of almonds from the prussic acid that it invariably contains, I believe there are none that are completely satisfactory, and some short time ago I was induced to make a few experiments in a new direction, with a view to finding a process for the purification of this essential oil that should not be subject to the objections to which the others are liable. Although I believe I have been to a certain extent successful, I wish merely to present some suggestions in order that some one who may have opportunities of working on a larger scale may, if so minded, repeat my experiments.

I have several times made use of a process founded upon a long-known reaction, and which consists in splitting up the hydrocyanic acid into formic acid and ammonia with the assistance of the elements of water,—

$$HC_2N+2H_2O_2=NH_3+C_2H_2O_4,$$

this change being effected by the action of a strong mineral acid.

Now when this decomposition is brought about in the presence of hydride of the benzoyl, formic acid is not set at liberty, but unites with the elements of the hydride, producing a conjugate acid, to which the name formo-benzoylic acid has been applied.

Its composition is represented by the following formula :— $C_{14}H_6O_2,C_2H_2O_4$. This body is easily formed by boiling a mixture of the distilled water of bitter almonds and hydrochloric

acid, sal-ammoniac being, of course, at the same time produced according to this equation—

$$C_{14}H_6O_2+HC_2N+HCl+2H_2O_2=NH_4Cl+C_{14}H_6O_2,C_2H_2O_4.$$

I imagined that if the formation of this substance, this acid, which of course takes a large proportion of hydride of benzoyl, could be prevented or diminished, this might prove a practicable process for the destruction of the hydrocyanic acid in the essence of almonds. I have not succeeded, by any means that I have tried, in preventing altogether the loss of hydride of benzoyl in this form, but I think it may be effected to a considerable extent. The method I have pursued is as follows:—The essential oil is mixed in a flask with about three times its bulk of ordinary hydrochloric acid diluted with a small quantity of water, a condenser attached, and distillation started. As soon as the oil begins to come over pretty freely, a quantity of water is added and distillation proceeded with. The oil is afterwards separated from the aqueous portion of the distillate; it is slightly acid, and to remove this a little piece of quicklime is put into it, which at the same time helps to dry the oil. If hydrate of lime be used for this purpose, the essence becomes slightly discolored.

Supposing the change represented in the equation above to take place strictly as there shown, a proportion of hydrocyanic acid in the oil amounting to 8 per cent. would cause a loss of no less than 31·4 per cent. of the hydride, in the form of the acid described; 5 per cent. of the hydrocyanic acid would remove 19·6 per cent. of hydride. Such a deficiency would be, of course, out of the question; but I have made in the manner described two rough quantitative experiments, and believe that the loss on the large scale would not amount to more than from 15 to 17 per cent., which would include hydrocyanic acid, benzoic acid, benzoine, and all the other impurities of the essence.

I now wish to describe another method, which was suggested at a meeting of the Chemical Discussion Association by my friend Mr. Broughton, and which had also occurred to myself, but at that time I had no opportunity of making the experiment.

Chemists have found that all the aldehyds with which we are acquainted form definite crystalline compounds with the alka-

line bisulphites; hydride of benzoyl, possessing as it does the characters of an aldehyd, being, in fact, the aldehyd of the benzoyl series, is no exception to this rule.

If, therefore, the crude essence of almonds be shaken up with three or four times its volume of a tolerable strong solution of bisulphite of soda and then allowed to rest, the mixture becomes warm and the hydride of benzoyl is all converted into a crystalline mass, having the composition represented by the following formula,—$C_{14}H_5NaO_2,S_2O_4,3Aq$. These crystals removed from the mother-liquor, which should be preserved, drained, and dried at a very gentle heat, and then dissolved in water, carbonate of soda in excess added, and the mixture distilled, yield hydride of benzoyl in a condition of absolute purity. By this plan, theoretically speaking, there is no loss beyond the actual impurities of the crude substance. This is certainly a recommendation, but a little trouble is involved in the double operation of preparing the crystals and their subsequent decomposition.

Having obtained the purified essence of almonds by any process that is most efficient, another desideratum is felt in the difficulty of preserving it from undergoing that oxidation and change with which every one is familiar. By exposure to the air, as every one knows, absorption of oxygen occurs and the liquid hydride is converted into crystalline benzoic acid,—

$$C_{14}H_6O_2+O_2=C_{14}H_6O_4,$$

and this change proceeds much more rapidly with the purified than with the unpurified oil.

For this defect there is a simple remedy, which I think is as efficient as anything of the kind can ever be expected to be. It is well known that in the presence of moisture oxidation is effected with infinitely greater facility than otherwise. Numerous examples of this may be easily adduced, but I can remember none more striking than the formation of rust upon the surface of iron. If then, the purified essence of almonds be perfectly dried by a lump of chloride of calcium introduced into it, the oxidation is retarded in a very marked degree. I cannot say that the essence attains the degree of permanence enjoined by the crude substance, but certainly the improvement is of the most decided character.—*London Pharm. Journal.*

## ON THE KOLA-NUT OF TROPICAL WEST AFRICA, (THE GUREE-NUT OF SOUDAN.)

By Dr. W. F. Daniell, F. L. S.

The seeds of the cola tree (*cola acuminata* R. Br.,) said the author, have been from time immemorial an important article of commerce among the natives of Central and Western Africa, and are to be found also in the markets of Fez, Tripoli, and other mercantile depots on the Mediterranean. The Portuguese merchants have always accepted the statement of the natives that the nuts are a luxury reserved for the chiefs and richer classes of natives, and are merely used as a means of rendering water pure and palatable; and thus never dreamt of the seeds containing a highly nitrogenised body. But the circumstances that all who can procure the nuts indulge in chewing them all day long, might have suggested that they contained something of much value, if not of actual necessity, in a country where animal food is scarce, and often difficult to procure. Dr. Daniell then proceeded to give an interesting account of the uses of the seed in aboriginal customs. It seems that when a trader visits a chief, the present of a few seeds from the latter conveys an assurance of welcome and protection. When sent as a present by one chief to another at a distance, the seeds are received as a sign of friendship, and the compliment is always reciprocated. In parts of the country where the kola tree is not indigenous, no business can be done with the higher classes without the gift of some of the nuts. Wives also are purchased with kola seeds; and the fetish man who raises the dead completes his charms with the offering of some of the seeds the deceased loved so much when alive. They are used, too, as propitiatory offerings to malignant spirits, and with peculiar customs to decide the question of peace or war between distant tribes. They are highly appreciated, too, as a gift on the departure of a guest for a long journey, in the course of which they are found of the greatest value in supporting strength and allaying hunger. The Portuguese, Dutch and English residents in Western Africa have adopted the use of the seeds, and now they seem to have become a necessity. They are not eaten at meals, but are carried in the hand, and fragments are chewed

at intervals, the pulp being spat out, and the soluble part only swallowed. The seeds have been supposed to possess the qualities of Peruvian bark; but the most prominent physiological effect of their use is insomnia, or want of sleep, and on this account they are used by the natives to prolong their orgies. The Portuguese have made a yellow dye from the seed. With regard to the name, it would seem that the seeds were originally called "Goro," or "Guro;" but the tribes of Western Africa, from a physical defect, are unable to pronounce the letter "r," for which they substitute "l," and among them the nuts are called "Kola," or "Gola," a name which has been adopted by the Portuguese. Dr. Daniell then gave extracts from the earlier African travellers, which showed that they had heard or become acquainted with the use and properties of the Kola seeds. Lastly, he stated that when on the Gold Coast in 1850 he suffered from a severe diarrhœa, for which the inhabitants were in the habit of employing a decoction of fresh seeds. He tried the remedy, and found that it deprived him of sleep. This led him to suspect the presence of theine in the seeds, and, when in Jamaica some years afterwards, he made some experiments to determine the presence, if possible, of this alkaloid. He did, in fact, obtain some crystals, which later researches have decided to be theine.

The reading of this paper was followed by a verbal account, by Dr. Attfield, of the results of his analysis of the seeds.—*Chem. News, Feb.* 10, 1865.

---

## DISCOVERY OF THEINE IN KOLA NUTS.

Professor Bentley said that he had been requested by Dr. Daniell to announce to the meeting that evening the important and interesting discovery of theine in the Kola nuts of commerce (*Sterculia acuminata*). Dr. Daniell had written to him as follows:—"My attention was directed to the peculiar stimulant effects resulting from taking a decoction of the seeds, in the permanent loss of sleep, which led me to infer from physiological induction that these seeds contained an alkaloid analogous to theine, and on a chemical examination with a view to

the discovery of that substance, I obtained a number of small silky, needle-like crystals, which proved to be that alkaloid. On my arrival in England, I placed in the hands of Dr. Attfield samples of the fragments of the nuts, stating that they produced theine, and wished him to test the validity of my conclusions. I am happy to state he has fully confirmed my discovery." Professor Bentley added that Dr. Daniell would read a paper on the subject at the next Pharmaceutical meeting, and also that Dr. Attfield would at the same time give the details of his analysis of Kola nuts. Professor Bentley thought it probable that the alkaloid thus obtained, from the near botanical affinity of the genus producing it to that from which cocoa and chocolate were obtained, might be theobromine instead of theine, although the appearance of the crystals, it must be admitted, was more that of theine.—*Lond. Pharm. Journal*, Feb., 1865.

---

## ON THE BOTANICAL ORIGIN OF GAMBOGE.

By Daniel Hanbury, F. L. S.

The botanical origin of Gamboge has been long involved in some obscurity, for although the drug was evidently produced by a plant of the genus *Garcinia* it has not until recently been possible, for want of good specimens, to determine the species.

Hermann, a Dutch naturalist of the seventeenth century, who resided in Ceylon, referred the origin of gamboge to two plants, one of which is known to modern botanists as *Garcinia Morella*, the other as *G. Cambogia*; and we have it, on the authority of Mr. Thwaites, Director of the Royal Botanic Garden of Peradenia, that the former is capable of affording a very good form of the drug, but that such is not the case with the latter. It is, however, well known that gamboge is not an export of Ceylon, but that it is a production of Siam, a country which is still nearly unexplored by the botanist. Whether gamboge in Siam was yielded by the same tree as that which affords it in Ceylon, was a question which could only be settled by a careful examination of good botanical specimens.

Some years ago Dr. Christison, of Edinburgh, received from Singapore specimens of a *Garcinia* cultivated there on the

estate of Messrs. D'Almeida and Sons, which *Garcinia* had been brought from Siam as the true gamboge-tree. Dr. Christison, whose account appeared in the "Pharmaceutical Journal" for November, 1850, found this plant to be nearly allied to the *G. elliptica* of Wallich, but to differ from that species in having male flowers *pedicellate*, instead of *sessile*. Desirous of carrying the inquiry a little further, and of attempting to set at rest the question of the origin of gamboge, I recently addressed myself to Messrs. D'Almeida, who promptly replied to my letter, and forwarded a jar containing numerous specimens of the gamboge-tree cultivated on their plantation at Singapore. These specimens I carefully examined, comparing them with published descriptions and figures, as well as with specimens contained in the herbaria of the British Museum, of the Royal Gardens of Kew, and of the Linnean Society, in which investigation I had the valuable assistance of my friend Professor Oliver. The correctness of Dr. Christison's observation respecting the pedicellate flowers was immediately obvious, and it was also evident that the plant, but for this character, bore a strong resemblance to *Garcinia elliptica;* we noticed further thas it came equally near to the *G. Morella* of Desrousseaux. Under these circumstances we thought it desirable to obtain the opinion of Mr. Thwaites, who, besides being an excellent botanist, was familiar with various species of *Garcinia* in a living state, and especially with *G. Morella*. Mr. Thwaites, after examining specimens of the Singapore gamboge-tree, which we had sent to him in Ceylon, replied that the plant was, in his opinion, a form of *G. Morella*, scarcely differing from the Ceylon type, except in having pedicellate instead of sessile flowers. This opinion was completely in accordance with that of Professor Oliver and other botanists whose opinion I had asked, and I therefore felt warranted in bringing the plant before the Linnean Society, in whose "Transactions" a figure of it has been published, under the following name and synonyms:—

GARCINIA MORELLA, Desrouss., var. *pedicellata*.

*G. Morella*, Desrousseaux, in Lamarck's Encylop. Méthod. Botan. iii. 701, pl. 405, fig. 2; Thwaites, Enum. Plant. Zeylan. i. 49.

*G. elliptica*, Wallich, Catal. no. 4869.

*G. Gutta*, Wight, Illustr. of Indian Botany, i. 126, tab. 44 (exclus. synon. Linnæi).

*Hebradendron cambogioides*, Graham, in Hooker's Companion to Bot. Mag. ii. (1836, 193, tab. 27).

Var. *β. pedicellata*; floribus masculis pedicellatis (pedicelli ad 3 lin. longi.)

Messrs. D'Almeida informed me that the number of gamboge-trees cultivated on their plantation is twenty-eight, but that it might have been increased to thousands had any pains been taken to do so. The trees are from thirty-five to fifty feet in height, the largest having a circumference of three feet. They grow very luxuriantly, without any attention, on the slope of a low hillock. Gamboge has at various times been extracted from them, but rather, it would seem, as an object of curiosity than for the purposes of commerce.—*Pharm. Journ.*, Jan., 1865.

---

## GROWTH OF THE BALSAM OF PERU TREE.

Seeds of the Balsam of Peru tree (*Myroxylon Pereiræ*, Kl.) transmitted by Dr. Charles Dorat, reached England in February, 1861, and young plants raised from them in English hot-houses are now from nine to fifteen inches high. Some of these seeds were sent to the Botanic Garden of Peradenia in Ceylon, whence Mr. Thwaites thus wrote in November last respecting the plants obtained from them:—"The largest plant I have of *Myroxylon Pereiræ* has a trunk *nine inches* in circumference close to the ground, and the largest of several branches into which it divides at about a foot from the ground is 11½ feet long." In Jamaica and Trinidad, young plants derived from the same source have grown with great vigor. Those in the latter island are described by Mr. Prestoe, Director of the Botanic Garden (under date Dec. 8th, 1864) as "nearly five feet high: their aspect beautiful in the extreme. I do not remember to have seen foliage of a more glossy or darker green; and they will doubtless be, ere long, magnificent trees. The rapidity of growth in such palnts in this country is something truly wonderful."—*Lond. Pharm. Journal*, Feb. 1865.

---

## THE SUGAR OF THE FUTURE.

To the Editor of the Chemical News.

Sir;—On page 299, vol. x., of your valuable paper appears, under the rubric of Continental Science, a single word about a

kind of sugar termed there, as the words used by my fellow-countryman and friend, Dr. J. E. de Vry, the sugar of the future. In reply to a note from me addressed to Dr. de Vry, I received the following letter, which I translate, and request you to insert it in your next impression, as it may contain some matter of interest to some of your readers.

DR. A. ADRIANI.

Dr. de Vry writes as follows:—"When, in the year 1857, I proceeded on my journey from Holland to Java, I stayed a month in Ceylon, and while there I became acquainted with the *Borassus flabelliformis*, vulgarly called by the Ceylonese-British inhabitants palm of Palmyra; and among other products of native industry my attention was called to the sugar sold by the natives under the name of *Jaggery*. The large number of the trees alluded to gave rise that, in conversation with parties in Ceylon, I uttered the idea of the possibility of applying the said palm trees, by regular cultivation, as a means of obtaining sugar on the large scale. As, however, my stay in Ceylon was only temporary, and as I, moreover, had neither time nor implements and apparatus for anything like a proper investigation, the matter was left at rest until, after having got settled in the interior of Java, my attention was aroused by the large quantity of sugar which is obtained by the Javanese inhabiting the Preanger Regentschappen from the Aren palm (*Arenga saccharifera.*) It is true that the late Professor Reinwardt* had asserted that the juice of this kind of palm yielded a sweet material, but he had, as was perceived by me at once, erroneously stated that this was simply glucose; for I found that the sugar obtained by the natives in a very rude and primitive manner contains even yet then a large proportion of cane sugar." Dr. de Vry describes the mode of preparation of sugar from the Aren palm, as carried on by the Javanese, as follows:—"As soon as the palm commences blooming, a portion of the stem carrying the blossom is cut away; there exudes from the wound so made a juice containing sugar, which juice is collected in tubes made from bamboo-cane previously exposed to smoke, with

* Dr. C. G. Reinwardt, late Professor of Botany and Chemistry of Leyden University, was, from 1816 to 1825 (nifallor,) in Java to organise the scientific researches there to be made by botanists, geologists, &c., &c.

the view of preventing the otherwise too rapidly proceeding fermentation of the juice under the joint influence of a warm climate, and the presence in the juice of a nitrogenous substance. The juice so obtained is immediately poured into shallow iron pans, heated by fire and inspissated by evaporation, until a drop of the liquid, exposed to cold by allowing it to fall on a cool surface, becomes solidified; if the desired degree of inspissation has been obtained, as evidenced by this experiment, the whole contents of the pan is cast into the shape of big cylindrical lozenges. Many thousands of pounds of sugar are annually obtained in this very primitive manner. I collected in a clean glass bottle a portion of the juice, and found that the unaltered juice does not contain any glucose at all, but it contains a nitrogenous principle which, aided by the warm climate, soon causes the conversion of a portion of the cane-sugar of the juice into glucose. In order to prove, without the aid of any very artificial means, that the juice of the Aren palm contains pure cane-sugar, I collected a portion of juice exuding from the tree, allowing it directly to flow into alcohol; by these means the nitrogenous principle alluded to is at once eliminated by coagulation. I thus obtained a mixture of equal parts of juice and alcohol; after filtration, this mixture was evaporated on a water-bath to the consistency of a syrup. This syrup I took along with me on my journey from Java home, and during the journey the concentrated syrup became solidified, exhibiting rare and beautifully well-defined crystals of cane-sugar, which, by every *connoisseur*, were immediately recognised. At the Congress at Giessen I have spoken about the manufacture of sugar from palm trees as the only rational mode of obtaining sugar in future, upon the following grounds:—Sugar, *per se*, consisting, as it does in a pure state, solely of carbon, hydrogen and oxygen, does not withdraw from the soil anything, but the plants now-a-days mainly cultivated for obtaining sugar therefrom—viz., the *Beta vulgaris* and *Canna indica*—want for their growth a large proportion of substances from the soil in which they are grown for their sustenance; hence their culture impoverishes the soil. This, however, is not the least evil, for what is worse is, that the space now occupied by beet-root in Europe, and by sugar-cane in the tropics, might and ought to serve for the growing of

corn or fodder crops in Europe, and for growing rice under the tropics; and it is my opinion that, owing to the steady increase of population both in Europe and Asia, the time may not be far distant that it will be imperatively necessary to apply the space of ground now devoted to beet-root and sugar-cane to the cultivation of corn-crops and rice, in order to supply the increasing demand for these staple articles of consumption. Whereas sugar-cane and beet-root require such soils as are also adapted for cerealia, the Aren palm flourishes in soils utterly unfit for that purpose, so unfit even that it would be in vain to attempt to render such soils fit for the growing of rice or cerealia; the Aren palm relishes the deep mountain ravines of Java, running, in some parts of the island, from the sea-shore so the interior, the said palm being found in groups together; and it is quite possible to lay out fine plantations of this beautiful tree. There is one drawback, though not a very serious one, viz., not before the trees have obtained an age of from ten to twelve years are they fit to yield sugar. When, however, it yields sugar, the tapping can be continued for many years, and the sugar manufacture will become a continuous—not as now, an interrupted—industry. According to my calculation, a field of 500 square Rynland† roods planted with these trees, would yield annually 40 picols‡ of sugar from a soil quite unfit for any other kind of agricultural service.

I am, &c.

Dr. J. E. DE VRY."

—*Chem. News.*, Feb. 3, 1865.

---

## REVIVED CORKS.

The attention of the French public has been called, by M. Stanislaus Martin, to the employment of refuse corks as dangerous to public health. It is the custom of the Paris scavengers to collect those which are brought down by the sewers, and sell them to persons who make it their business to revive them. If the corks are of unsightly shape they are re-cut; while, if containing holes, these are filled up with mastic, and then smeared with a powder to give them a proper color. Such corks used only to be employed by the ink and blacking makers, but their low price (5s. 6d. per 1000) has of late induced retailers

† Equal to about three-quarters of an acre.
‡ One picol is equal to about 60 kilogrammes.

of bottled beverages to purchase them. M. Martin asks if there be not ground for alarm lest some of these corks may have been formerly used to stop bottles containing poisonous substances; for although a good cork is not permeable, a bad one, full of holes, may readily become the receptacle of particles of verdigris, carbonate of lead, arsenic, or an infinity of other poisonous substances, which may be more or less soluble in water, wine, beer, cider, vinegar, milk, or oil. The *Medical Times* expressess a hope that these revived corks may never give rise to juridical errors, causing the innocent to be declared guilty.—*Chem. News*, Nov. 26, 1864.

---

# Editorial Department.

PHARMACY IN THE ARMY.—Our readers will find three articles relating to this subject in this number. Notwithstanding some repetition we have preferred to publish both of those in reference to medical store keepers. The paper from Memphis had appended to it a valuable report on the actual amounts of medical stores distributed to the army of the south western States from the Memphis depot, but its publication has been deferred for the present. We are in anticipation of some reports from Hospital Stewards, relative to field service, and invite our friends in that service to communicate any facts of special interest. The well written article by Dr. Fell, in this number, gives an insight into the Pharmacy of a large Army Hospital, creditable to the executive management of the Medical Bureau. The most interesting part of this subject has reference to the purveying departments of New York and Philadelphia, including the statistics of the laboratories at Astoria and Philadelphia. The former has recently been destroyed by fire, and we do not know whether it will be rebuilt or not. At a proper time we hope to be able to publish reports on these, when we can do it with the approval of the Bureau at Washington.

---

HOSPITAL STEWARDS. *The Caduceus* for Feb. 1st. A copy of this sheet, which is "devoted to the interests of the Hospital Stewards" of the United States Army, and published twice monthly at Washington, has been sent to us, containing an appeal to the Senators and Members of Congress in relation to the status of Hospital Stewards in the Army; and asking for the "increase of rank and pay of this class of Government employees to that of Brevet Second Lieutenants, to take rank after the graduates of West Point Military Academy." The reasons offered for asking this boon are the following:

"1. The duties of a Hospital Steward surpass in arduousness of execution and intricacy of detail, those of any other non-commissioned officer in the service, compelling him to possess a thorough knowledge, not only of the Medical, but of the Commissary, Ordnance, and Quartermaster's Departments.

2. They exceed—we state this with the respect due the rank—the duties and responsibilities of the rank asked for, in any branch of the service.

3. They are required to possess a fair professional education—and to undergo a strict examination *previous* to their appointment—a qualification required only of commissioned officers, with this solitary exception.

4. The Army Regulations already partially recognize the fact of the injustice of classing them with enlisted men, by allowing their resignations to be favorably considered, and prohibiting their reduction to the ranks.

5. Clerks in the Quartermaster's, Ordnance and other Departments of the Army, getting double, treble, and even quadruple their pay, are required to possess no superior attainments, and none of the medical knowledge necessarily required of Hospital Stewards.

6. In the execution of their duties they are compelled to enforce obedience over two non-commissioned ranks above them, a fact contrary to the spirit of the Regulations.

7. When on detached duty at Departmental Head-Quarters, they receive no extra pay, although an order from the War Department directs that all enlisted men on such duty shall receive it; here they are again treated as commissioned officers and not as enlisted men.

8. They have no opportunity for promotion, and can seek in the approval of their superiors only, their reward for duty faithfully discharged."

The paper is published under the superintendence of a central committee of the Stewards at Washington.

---

The Alumni Association of the Philadelphia College of Pharmacy.—A number of the graduates of this Institution have formed an association under the above title, and propose to hold a general meeting in the present month (March,) with a view to its extension. The number of graduates is now so large that a fair prospect offers for a numerous membership, and with a proper *esprit de corps* the association will prove a useful agent in upholding the professional character of its members, and through them, of the Pharmaceutical body at large. In our next issue we hope to notice the results of the ensuing meeting, and will then give a statement of its organization.

---

Saint Louis College of Pharmacy.—The following announcement of the reorganization of Pharmaceutists in St. Louis under the above title, with the prospect of opening a School of Pharmacy the ensuing winter, will be hailed with pleasure by all advocates of Pharmaceutical progress. The old "St. Louis Pharmaceutical Association" did not survive the shock of the upturning influences which marked the breaking out of the Rebellion, and never seemed to possess strong vitality. We trust that the new movement will be made under happier auspices, and that the St. Louis College

of Pharmacy will invigorate Western Pharmacy and become an important center of Pharmaceutical instruction and progress.

722 *Broadway, St. Louis, January* 31, 1865.

PROF. PROCTER,

*Dear Sir:*

I have the pleasure of announcing to you that a College of Pharmacy was founded in our City two months ago, under the name of the "Saint Louis College of Pharmacy."

I have been requested to forward to you, for publication in your excellent Journal, the names of the officers elected. The Board of Trustees have decided to defer the commencement of lectures until next November; the Professors of the College have not been elected yet. We have adopted the Constitution and By-Laws of the Philadelphia College. Knowing the interest you always manifest towards the progress of Pharmacy as a Science, we are sure you cordially extend towards us the right hand of fellowship, and wish us good success in our undertaking.

I am, dear sir, truly yours,

JAMES O'GALLAGHER, M. D.,
*Corresponding Secretary of Saint Louis College of Pharmacy.*

OFFICERS OF THE SAINT LOUIS COLLEGE OF PHARMACY.

*President.*—Alexander Leitch.
*Vice Presidents.*—Eugene L. Massot, Enno Sander.
*Secretary.*—Charles L. Lips, M. D.
*Corresponding Secretary.*—James O'Gallagher, M. D.
*Treasurer.*—M. W. Alexander.
*Register Pharmaceutical Meetings.*—John R. Coleman, M. D.
*Board of Trustees.*—Ex-officio the Officers of the College, Eugene L. Massot, *Chairman*, Henry Shaw, John Barnes, M. D., Charles Roesch, M. D., John Laughton, M. D., James McBride, *Secretary*, Hubert Prim, H. Kirchner, Col. John O'Fallon, Isaac H. Sturgeon, M. M. Pallen, M. D., George Engelmann, M. D., John T. Hodgen, M. D., Theodore Kalb, F. W. Sennewald, E. Fanold, William D'Anch.

---

THE UNITED STATES DISPENSATORY. The twelfth edition of this great work, which has been in course of revision during several years past, is rapidly approaching completion. Its appearance has been delayed by the death of Dr. Bache, throwing the labor chiefly on Dr. Wood; but especially by the unusual mass of materials which seven years have evolved, including the many changes rendered necessary by the revision of the United States and British Pharmacopœias. With every endeavor to keep the size of the volume within its present limits, more than a hundred pages will be added to it, notwithstanding the great saving of space by the consolidation of the three British Pharmacopœias into one. There is every reason to believe that the work will be published between the middle and the end of March.

---

OUR SCHOOL OF PHARMACY.—About thirty students of the Class 1864–65 have passed the examination of the present term, out of a class of 100. The Annual Commencement will be held on Saturday evening, the 11th of March, at the Musical Fund Hall, on which occasion Prof. Parrish is expected to deliver the Valedictory Address.

"PHARMACY IN AMERICA" THROUGH ENGLISH SPECTACLES.—If our cotemporary of the Pharmaceutical Journal admitted into its columns the article headed "Pharmacy in America," in that Journal for December, believing it to convey a truthful impression of the state of pharmacy here, it may satisfactorily account for an obliquity of vision which prevents him from seeing any merit in numerous papers that have originally appeared in this country. As a pharmaceutical journal should aim to give a record of the progress of science irrespective of its origin, and especially of that developed in its own language; we believe the Pharmaceutical Journal, as almost the sole exponent of the science of Pharmacy in Great Britain, would give a better view of "Pharmacy in America," and serve the cause of science, by publishing such papers as that of Wenzell, on Ergot, in this Journal for May, 1864, and several others, which have reached European readers through a German translation.

---

*Proceedings of the American Pharmaceutical Association at its Twelfth Annual Meeting; held in Cincinnati, Ohio, September*, 1864; also the revised Constitution and Roll of Members. Philad., pp. 335, octavo.

We acknowledge with pleasure the receipt of this Annual, which made its appearance about the 18th of February, after more delay than usual, arising from causes, explained by Prof. Maisch in the prefatory note relating chiefly to the transmission of proof sheets, and the execution of the illustrations. We have already, in November last, printed the minutes, and have given therein a list of the papers read at the meeting, and which constitute the volume before us.

Of the Reports, that on the Progress of Pharmacy, by George J. Scattergood occupies one hundred and thirty pages, and is arranged on the plan followed for several years past, initiated in 1862, by Prof. Maisch, classifying the subjects under various heads and sub-heads.

The continuation of these Reports, if nothing else was included, will warrant the publication of an annual volume. The report on the Drug Market by Prof. Maisch next follows, occupying twenty pages, including an appendix by J. J. Thomsen of Baltimore. This report though necessarily made under disadvantageous circumstances, conveys much information, and encourages the view that hereafter the labor of this committee may become very useful.

There are twenty special reports and seven volunteer essays, which together are more numerous than on any previous year, and though none of them of great length, are creditable productions, and worth the attention of members not present at the meeting.

The paper on "The Pharmaceutist as a Merchant," by Frederick Stearns, commends itself to the attention of every young pharmaceutist, as full of sound and healthy advice on the conduction of our business. Prof. Mayer, in his paper on Tobacco, arrives by experiment at the conclusion "that Nicotina is the active principle of all parts of the plant before and after curing," and that recent tobacco contains no ammonia or

trimethylina. Mr. Gordon's paper on glycerin and its applications possesses considerable interest, especially in reference to its use as a menstruum in extracting spices, etc. One of the best papers is that by Dr. Stabler on a hydraulic press adapted to the purposes of pharmacy, which is illustrated with two lithographs, that render its internal construction, though complex, easily understood. It stands on a base 18 inches square, and has a power of 10 tons pressure.

The question of the botanical source of "Southern prickly Ash" has been definitely settled by the paper of Dr. Bridges, from specimens sent from Beaufort, South Carolina.

Among the volunteer essays, the most extended is that of Prof. Parrish, on "a systematic course of study and manipulation for students of Pharmacy." The papers of Prof. Maisch on the assay of French Brandy, Sherry Wine and Whisky as conducted at the army laboratory, offer many valuable suggestions. The paper on Oleum Ethereum by C. Lewis Deihl, Jr., is particularly deserving of notice. This, and several of the papers mentioned, will be found in this number. We have not had leisure to examine the book closely, but we have the statement of Prof. Maisch that great care has been taken to avoid errors of the press. The cost of the volume has been about 33 per cent. more than that of 1863, a difference due to the cost of material and labor, and to the more expensive illustrations in this volume. We hope the committee will succeed in getting it distributed as early as practicable.

The address of Prof. Maisch, Editor, and Chairman of the Executive Committee, is U. S. Army Laboratory, Sixth and Oxford Sts., Philad., Pa.

As it is now the duty of the Executive Committee to withhold this volume from all members who are four years in arrears, it is to be hoped that such delinquents will forward their dues to the Treasurer, J. Brown Baxley, Baltimore, and have the Proceedings sent to them. The much greater cost of this volume than usual renders such action on the part of all members in arrears very desirable.

---

*Medical Lexicon. A Dictionary of Medical Science;* containing a concise explanation of the various subjects and terms of Anatomy, Physiology, Pathology, Hygiene, Therapeutics, Pharmacology, Pharmacy, Surgery, Obstetrics, Medical Jurisprudence and Dentistry: notices of climate and of mineral waters, formulæ for officinal, empyrical and dietetic preparations, with the accentuation and etymology of the terms; and the French and other synonymes, so as to constitute a French as well as English medical lexicon. By Robley Dunglison, M. D., LL. D., &c. Thoroughly revised and very greatly modified and augmented. Phila.: Blanchard & Lea, 1865; pp. 1047 octavo, closely printed.

Our readers will be gratified to learn that this new edition has been published. It reached us too late for notice in this number.